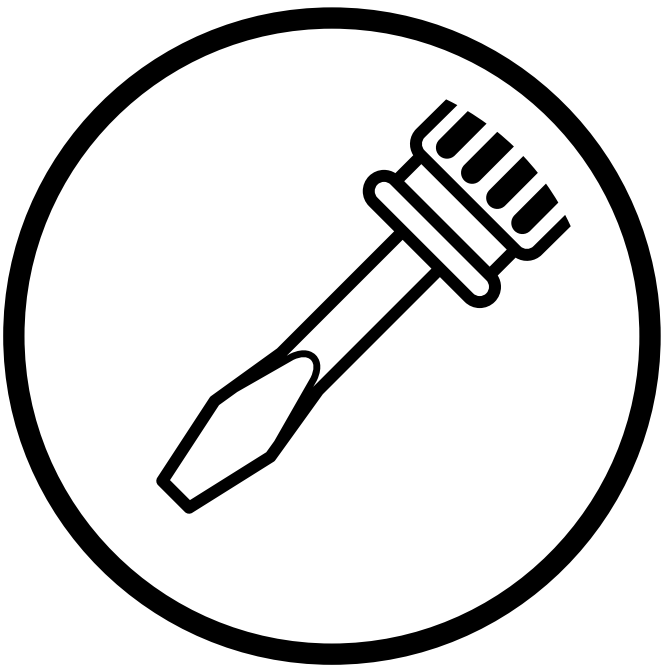
LZ2-B850, B850W
LZ2-B851

SERVICE MANUAL

Please read this manual before making any adjustments.

SINGLE NEEDLE ZIGZAG LOCK STITCHER



brother®

This service manual is intended for B850, B851; be sure to read the B850, B851 instruction manual before this manual.
Carefully read the “SAFETY INSTRUCTIONS” below and the whole of this manual to understand this product before you start maintenance.
As a result of research and improvements regarding this product, some details of this manual may not be the same as those for the product you purchased.
If you have any questions regarding this product, please contact a Brother dealer.

SAFETY INSTRUCTIONS

1. Safety indications and their meanings

This service manual and the indications and symbols that are used on the machine itself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people.
The meanings of these indications and symbols are given below.

Indications

⚠ CAUTION	The instructions which follow this term indicate situations where failure to follow the instructions could cause injury when using the machine or physical damage to equipment and surroundings.

Symbols

..... This symbol (△) indicates something that you should be careful of. The picture inside the triangle indicates the nature of the caution that must be taken.
(For example, the symbol at left means “beware of injury”.)

..... This symbol (⃠) indicates something that you must not do.

..... This symbol (●) indicates something that you must do. The picture inside the circle indicates the nature of the thing that must be done.
(For example, the symbol at left means “you must make the ground connection”.)

⚠ CAUTION

Environmental requirements

- Use the sewing machine in an area which is free from sources of strong electrical noise such as high-frequency welders.
  Sources of strong electrical noise may cause problems with correct operation.
- Any fluctuations in the power supply voltage should be within ±10% of the rated voltage for the machine.
  Voltage fluctuations which are greater than this may cause problems with correct operation.
- The power supply capacity should be greater than the requirements for the sewing machine's electrical consumption.
  Insufficient power supply capacity may cause problems with correct operation.
- The ambient temperature should be within the range of 5°C to 35°C during use.
  Temperatures which are lower or higher than this may cause problems with correct operation.
- The relative humidity should be within the range of 45% to 85% during use, and no dew formation should occur in any devices.
  Excessively dry or humid environments and dew formation may cause problems with correct operation.
- Avoid exposure to direct sunlight during use.
  Exposure to direct sunlight may cause problems with correct operation.
- In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet.
  Lightning may cause problems with correct operation.

Installation

- Machine installation should only be carried out by a qualified technician.
- Contact your Brother dealer or a qualified electrician for any electrical work that may need to be done.
- The sewing machine weighs more than 38 kg. The installation should be carried out by two or more people.
- Do not connect the power cord until installation is complete, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
- Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.
- All cords should be secured at least 25 mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples, otherwise there is the danger that fire or electric shocks could occur.
- Install the belt covers to the machine head and motor.
- If using a work table which has casters, the casters should be secured in such a way so that they cannot move.
- Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.
  Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhoea.
  Keep the oil out of the reach of children.

⚠ CAUTION

Sewing

This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.

The sewing machine should not be used for any applications other than sewing.

Be sure to wear protective goggles when using the machine.
If goggles are not worn, there is the danger that if a needle breaks, parts of the broken needle may enter your eyes and injury may result.

Turn off the power switch at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
- When threading the needle
- When replacing the needle and bobbin
- When not using the machine and when leaving the machine unattended

* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

If using a work table which has casters, the casters should be secured in such a way so that they cannot move.

Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.

Do not touch any of the moving parts or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.

If an error occurs in machine, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest Brother dealer or a qualified technician.

If the machine develops a problem, contact your nearest Brother dealer or a qualified technician.

Cleaning

Turn off the power switch before carrying out cleaning, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.

* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.
Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhoea.
Keep the oil out of the reach of children.

Maintenance and inspection

Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.

Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.

Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook

* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

Be careful not to touch your fingers or the lubrication amount check sheet against moving parts such as the rotary hook or the feed mechanism when checking the amount of oil supplied to the rotary hook, otherwise injury may result.

Use only the proper replacement parts as specified by Brother.

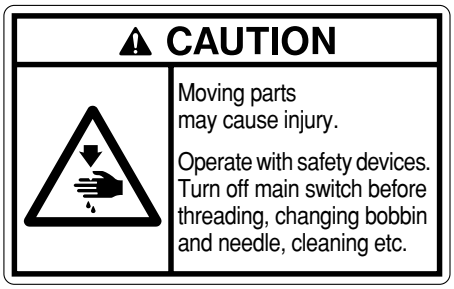
If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

3. Warning labels

• The following warning labels appear on the sewing machine.
Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest Brother dealer.

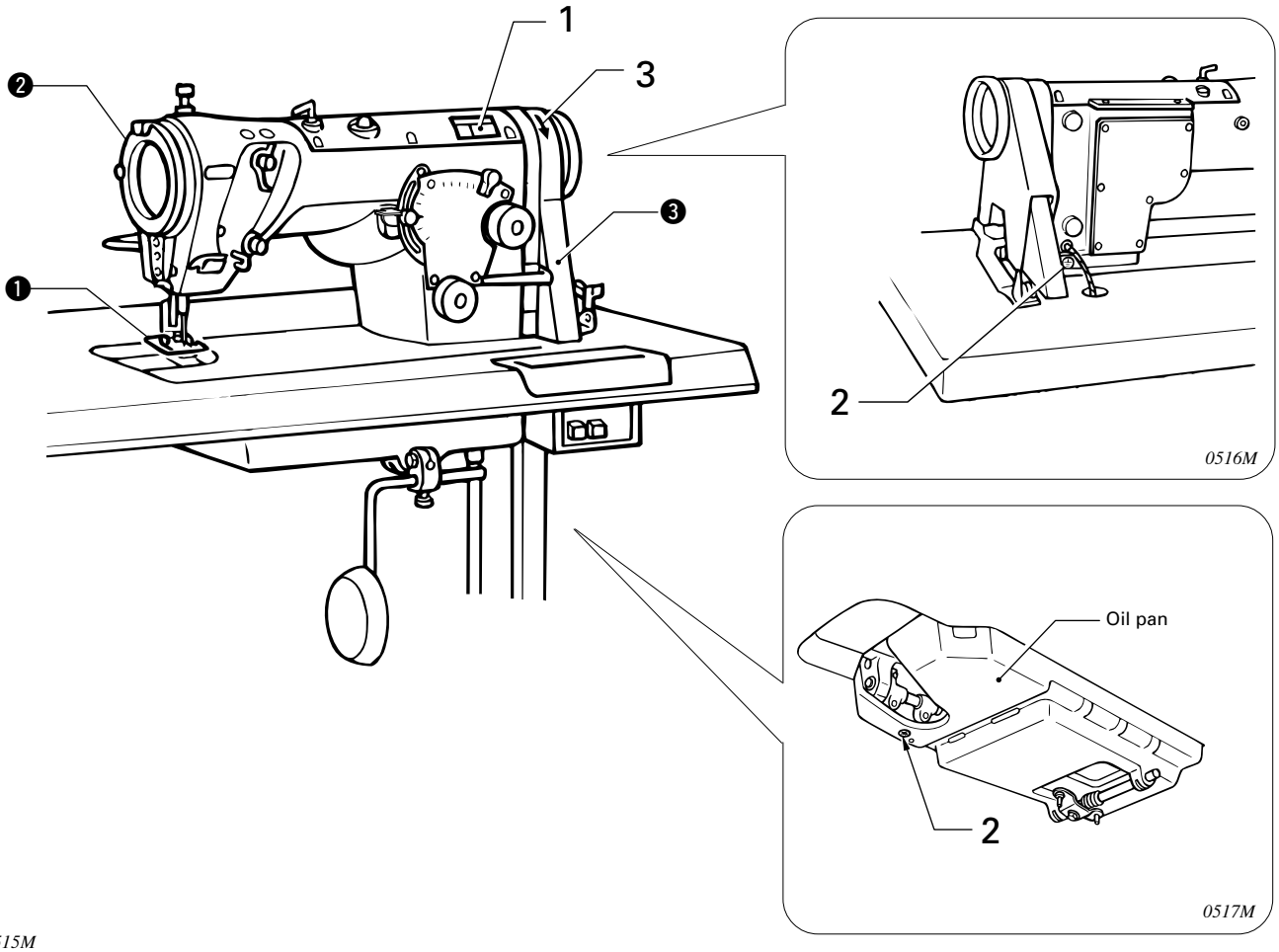
1



Safety devices
- ❶ Finger guard
- ❷ Thread take-up guard cover
- ❸ Belt cover, etc.

2 • Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

3 • Direction of operation



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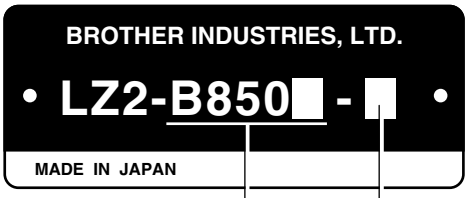
1. MACHINE SPECIFICATIONS



		B850	B850W		B851
Sewing pattern		Plain zigzag (Narrow)	Plain zigzag (Wide)		3-step zigzag
		0520M	0521M		0522M
→		-1	-1	-3	-1
Use		For light-weight materials-medium-weight materrials			
Maximum stitch length		2.5mm	2.5mm	5mm	2.5mm
Max. zigzag width		5mm	8mm		
Max. sewing speed		5,000rpm			
Thread take-up lever		Rotary thread take-up			
Needle bar stroke		33.3mm			
Feed dog height		1mm			
Presser foot height	Presser bar lifter	6mm			
	Knee lifter	10mm			
Presser foot pressure		20-60N			
Needle		Schmetz SY1965 Nm 70/10			

<Motor pulley and V-belt>

- Select the correct motor pulley and V-belt by referring to the table below to suit the power frequency of your area.

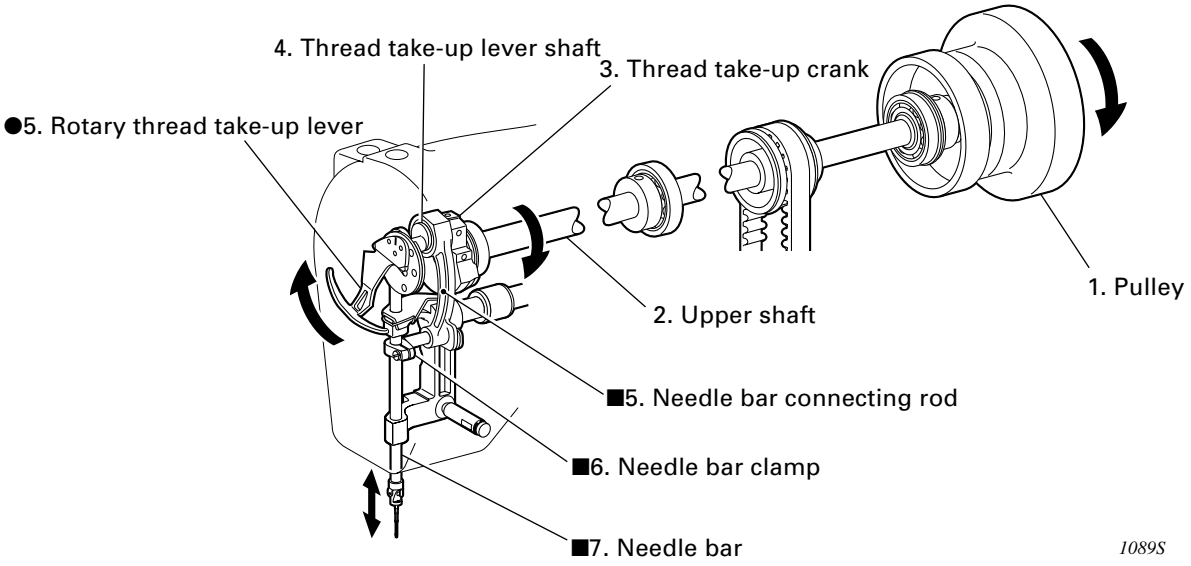
* However, depending on the installation position of the motor, the V-belt size may differ from that given in the table.

Pulley O.D.	(mm)	65	70	75	80	85	90	95	100	105	110	115	120
Belt size (inches)		M42			M43			M44				M45	
Sewing speed (rpm)	50Hz	2500		3000		3500			4000		4500		5000
	60Hz	3000		3500		4000		4500		5000			

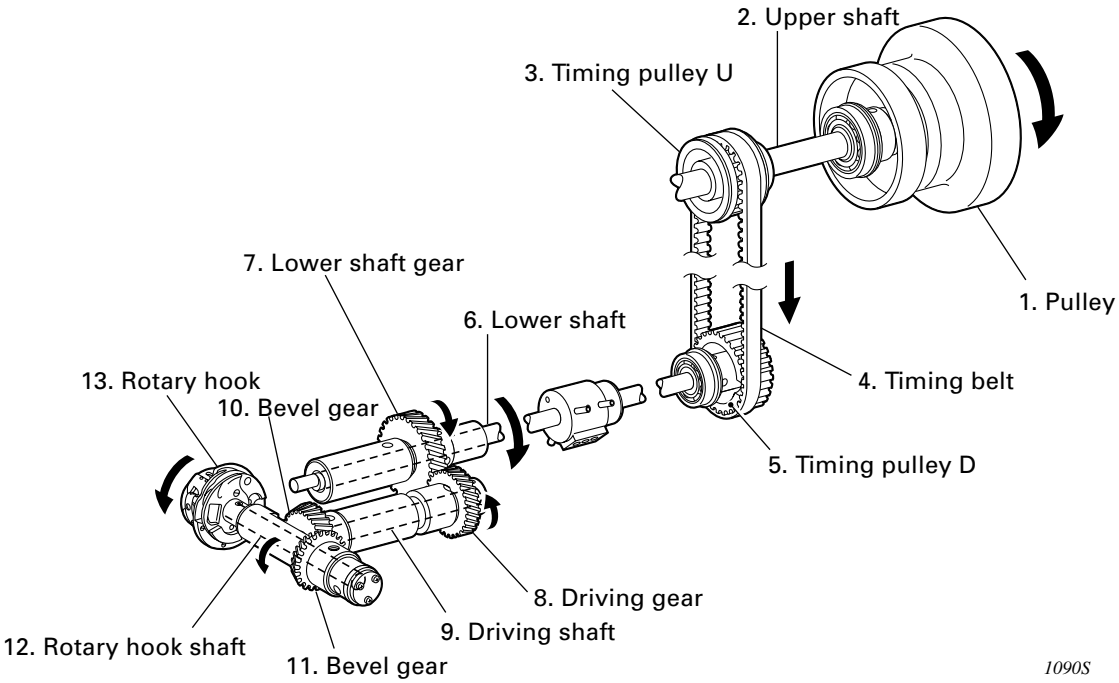
2. MECHANICAL DESCRIPTIONS

Operate in the order of the numbers in the illustration.
The ● , ■ and other symbols with the numbers indicate different sequences of operation which can occur at the same time.

2-1. Needle bar and thread take-up mechanism

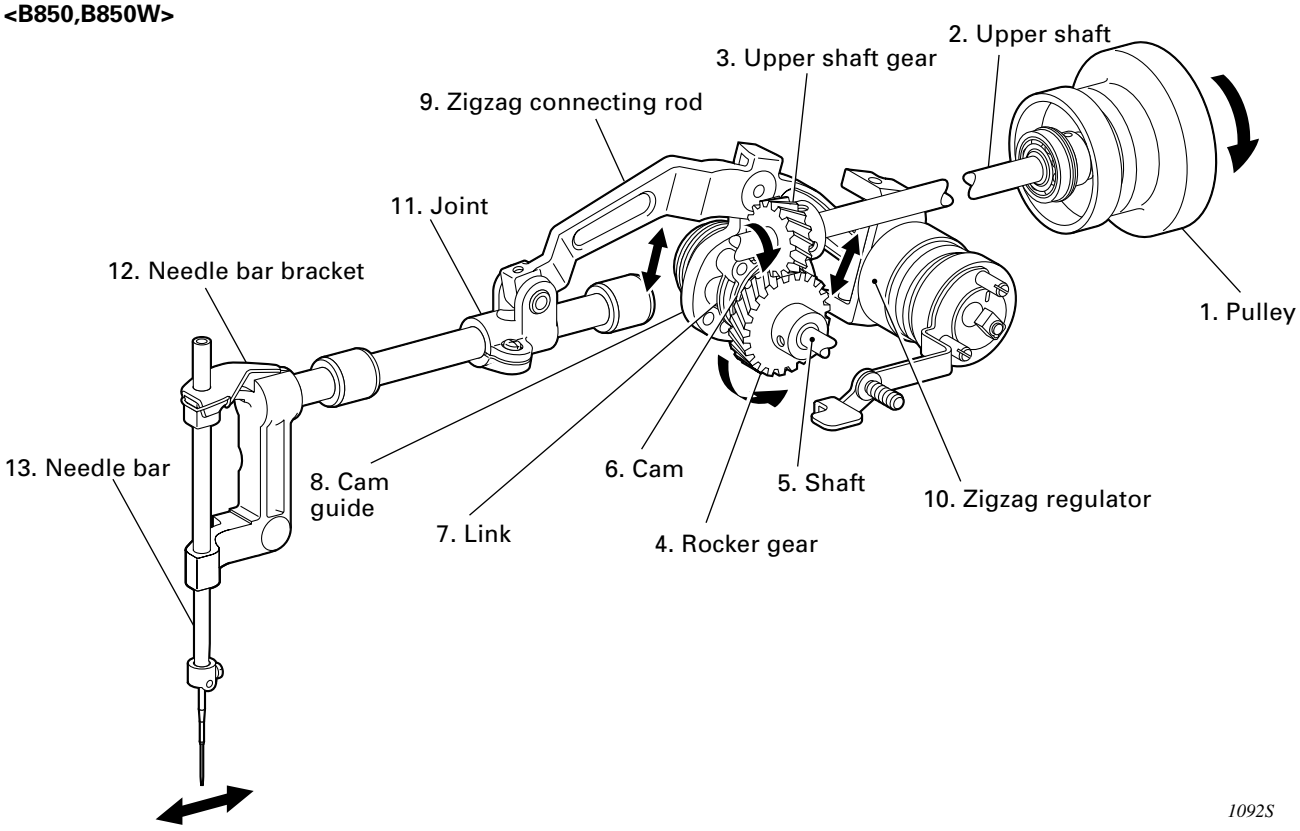


2-2. Lower shaft and rotary hook mechanism

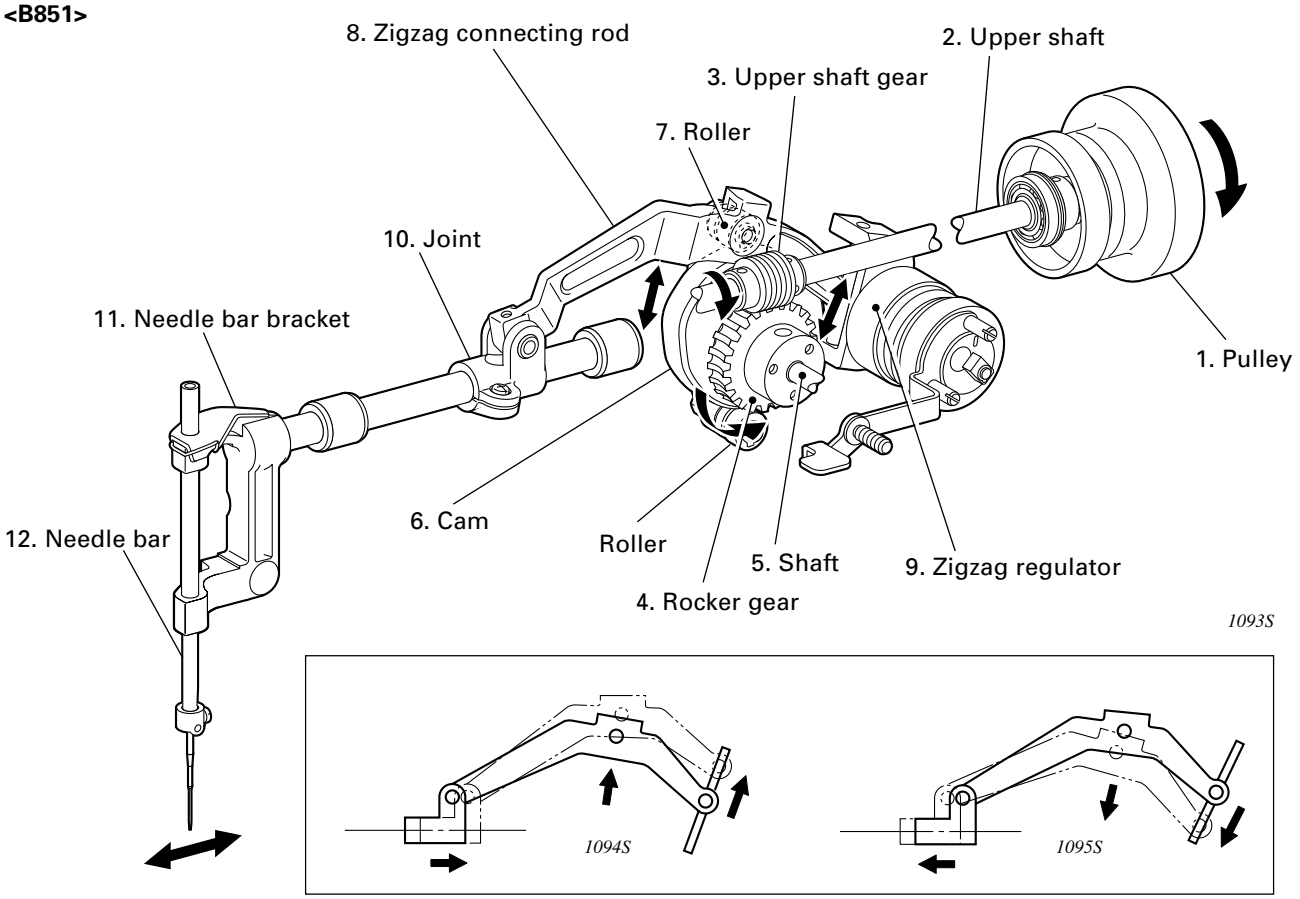


2-3. Zigzag mechanism

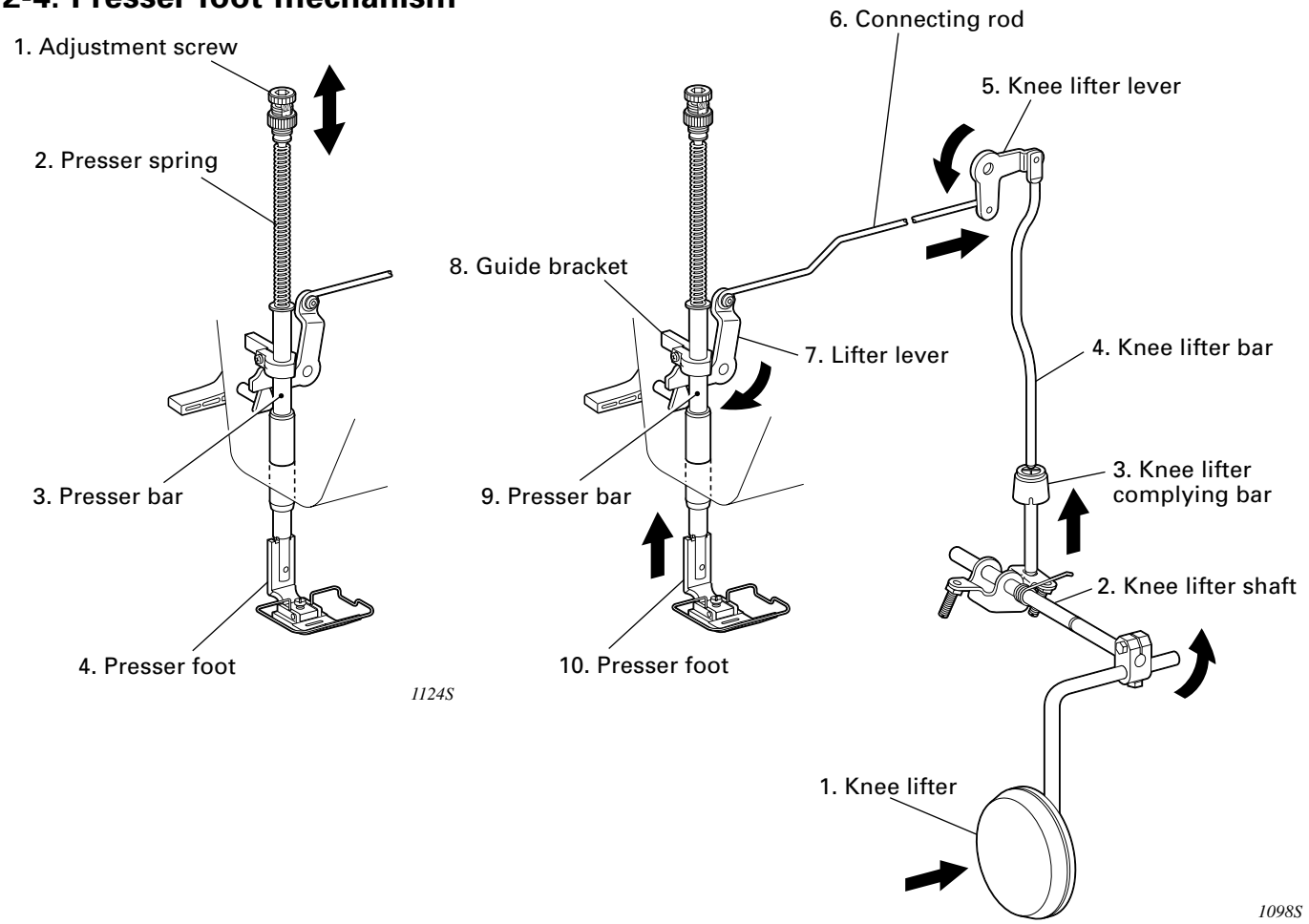
<B850,B850W>

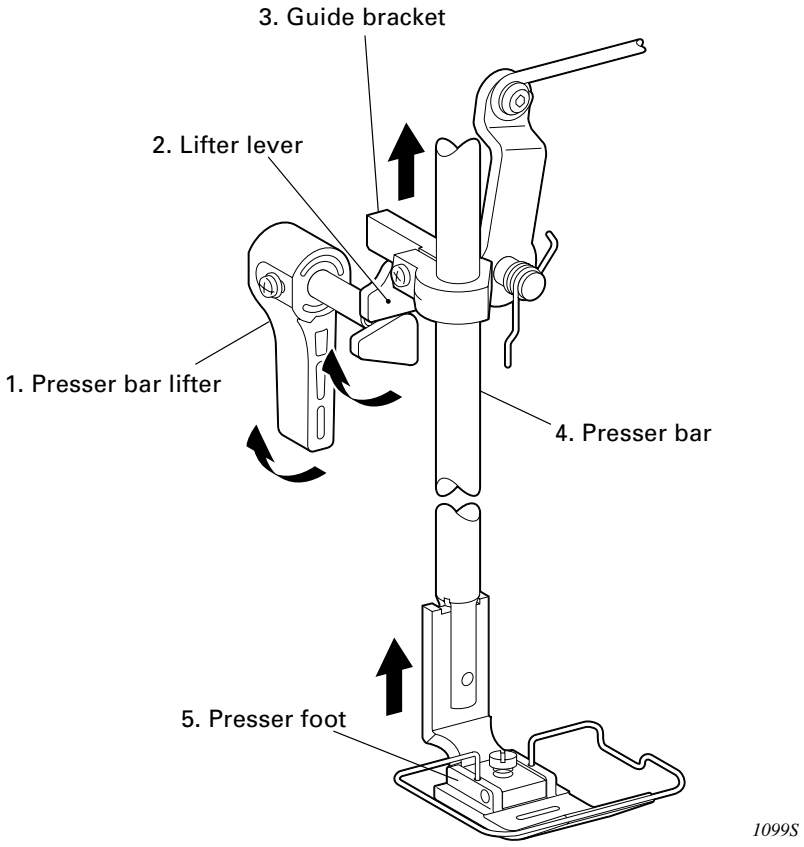


<B851>

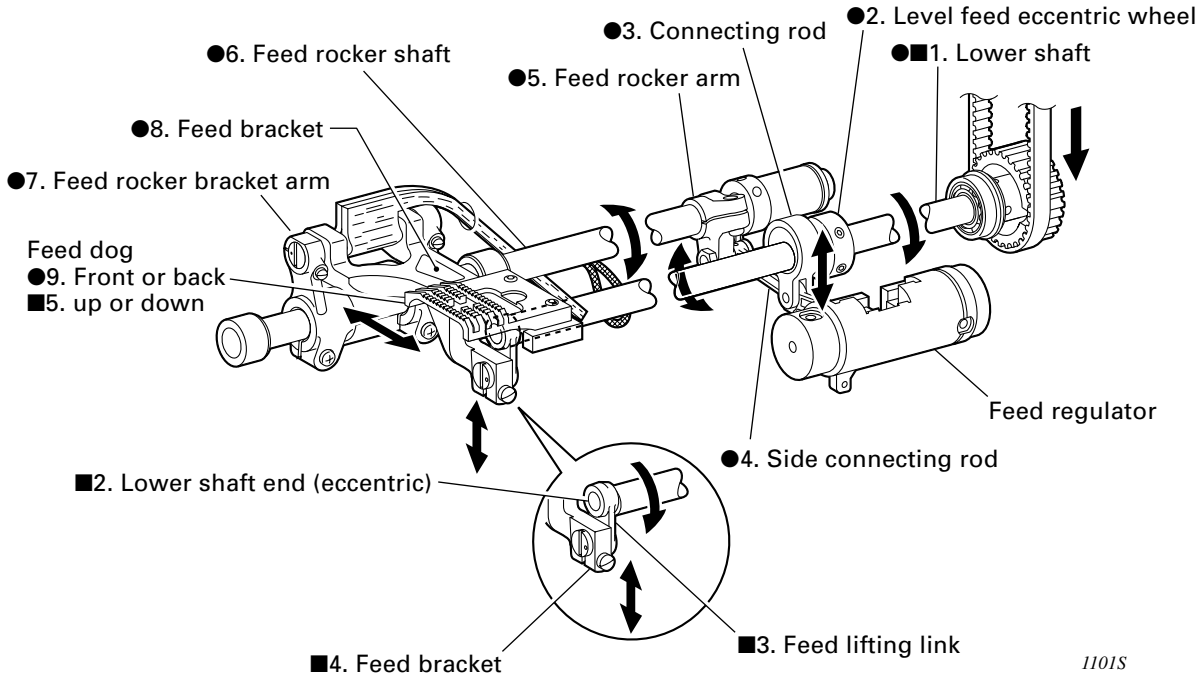


2-4. Presser foot mechanism

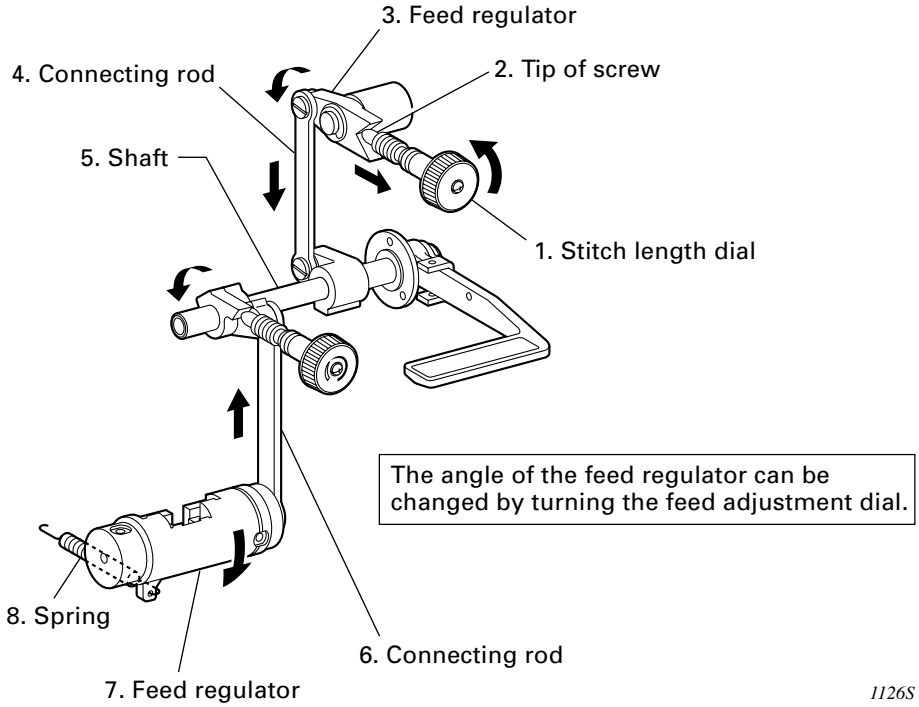


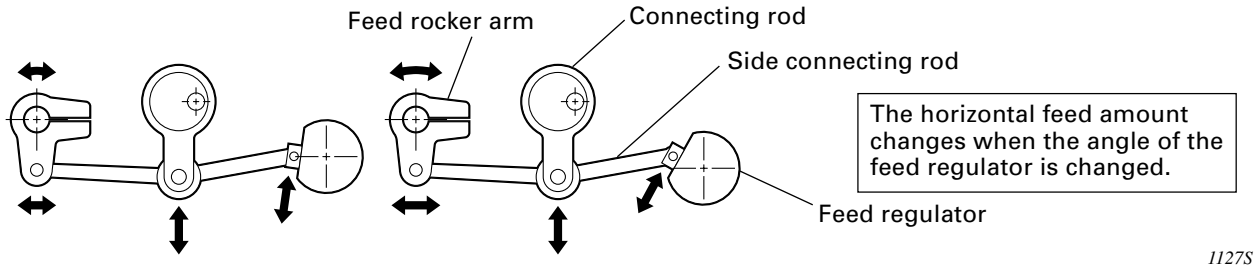


2-5. Feed mechanism

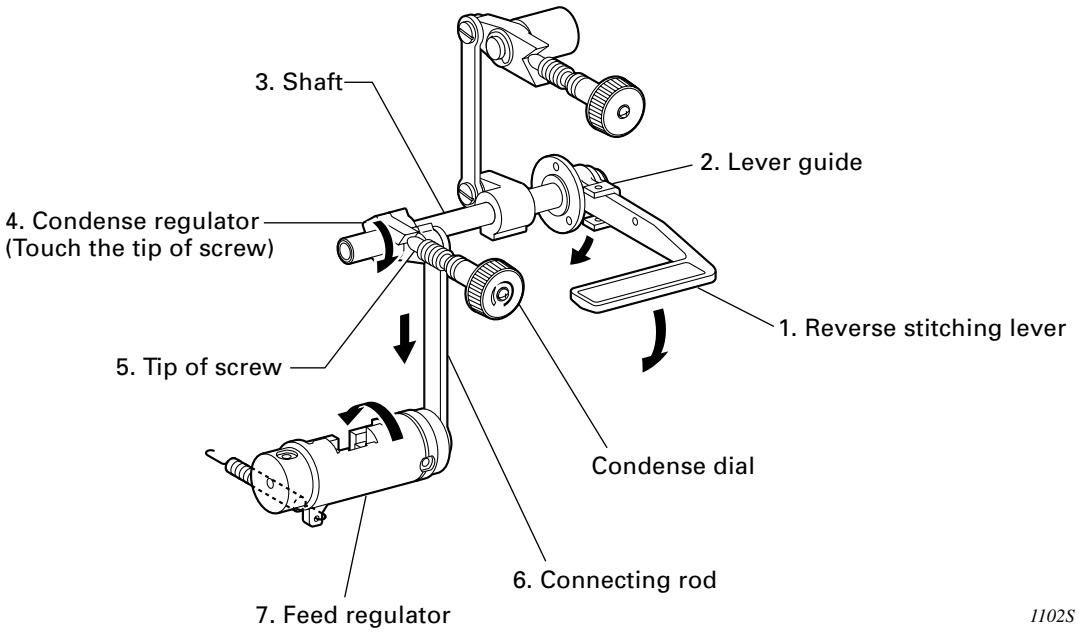


<Dial feed mechanism>


3. Feed regulator
4. Connecting rod
2. Tip of screw
5. Shaft
1. Stitch length dial
The angle of the feed regulator can be changed by turning the feed adjustment dial.
8. Spring
6. Connecting rod
7. Feed regulator
1126S


Feed rocker arm
Connecting rod
Side connecting rod
The horizontal feed amount changes when the angle of the feed regulator is changed.
Feed regulator
1127S

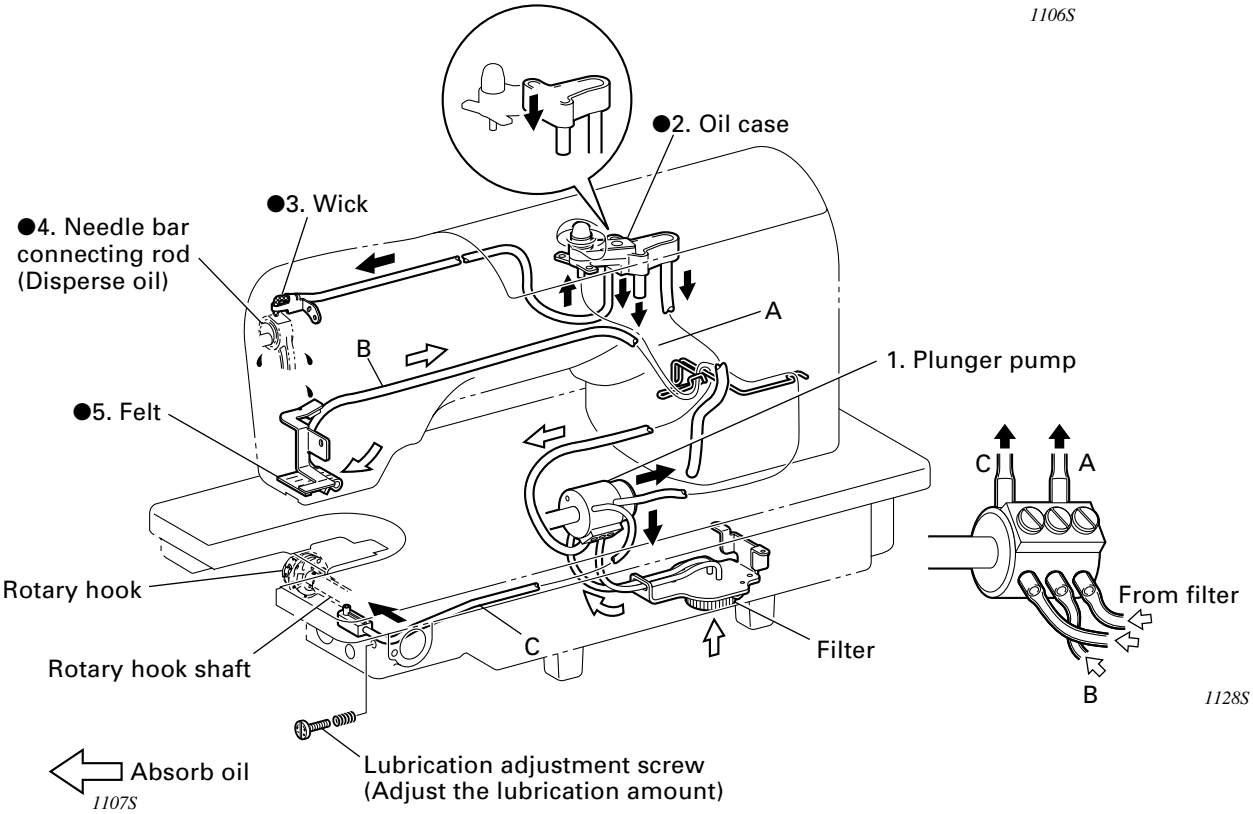
< Back tack mechanism >

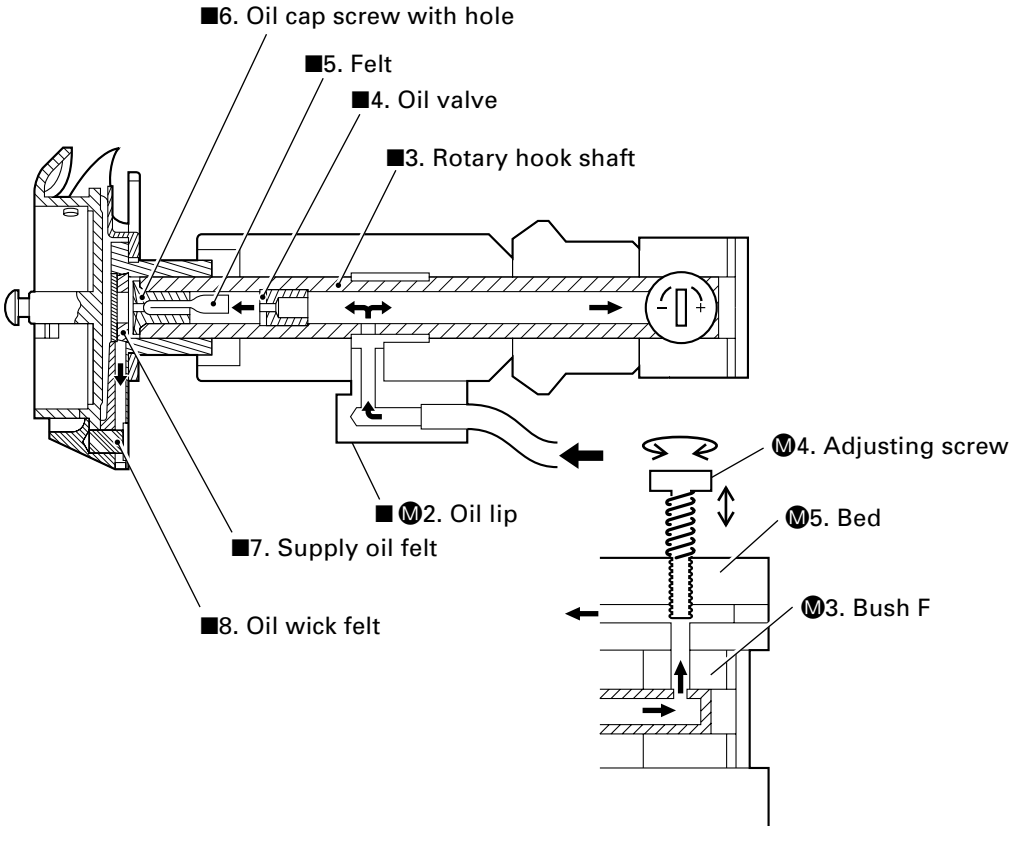


The angle of the feed regulator when the backtack lever is pressed down can be changed by adjusting the condense dial.
When the condense dial is turned to the - (minus) side of the scale, the angle of the feed regulator becomes greater and reverse feeding is carried out.

2-6. Lubrication

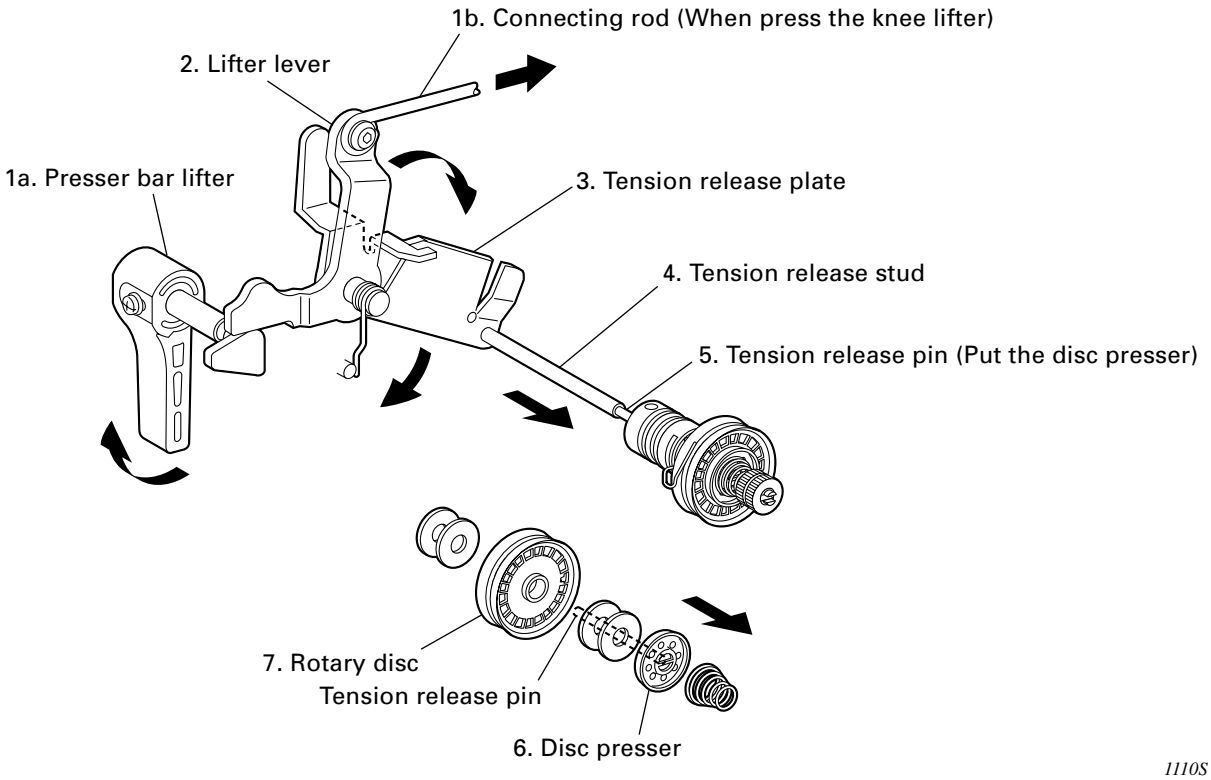
1106S





1129S

2-7. Tension release mechanism


1b. Connecting rod (When press the knee lifter)
2. Lifter lever
1a. Presser bar lifter
3. Tension release plate
4. Tension release stud
5. Tension release pin (Put the disc presser)
7. Rotary disc
Tension release pin
6. Disc presser

1110S

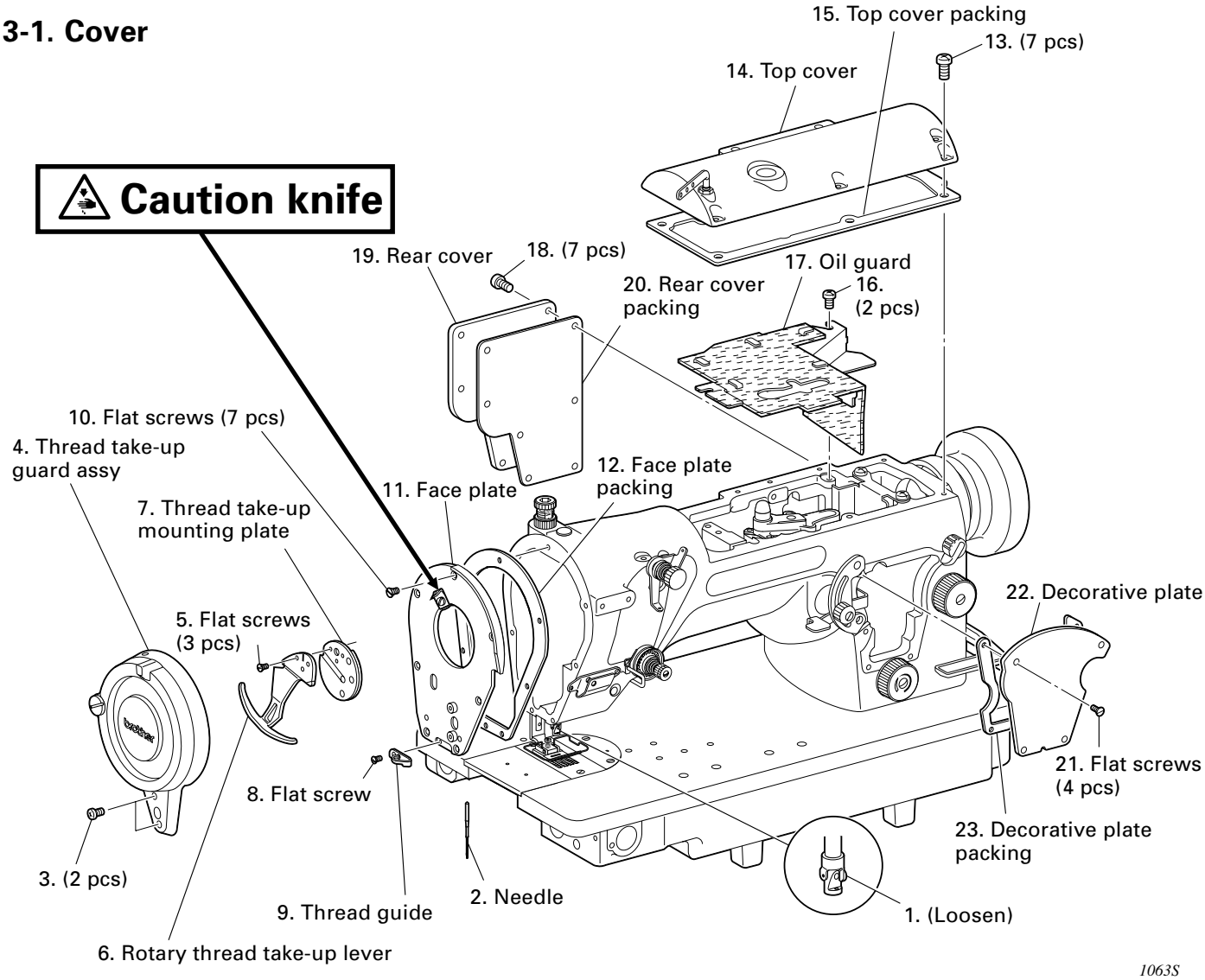
3. DISASSEMBLY

⚠ CAUTION

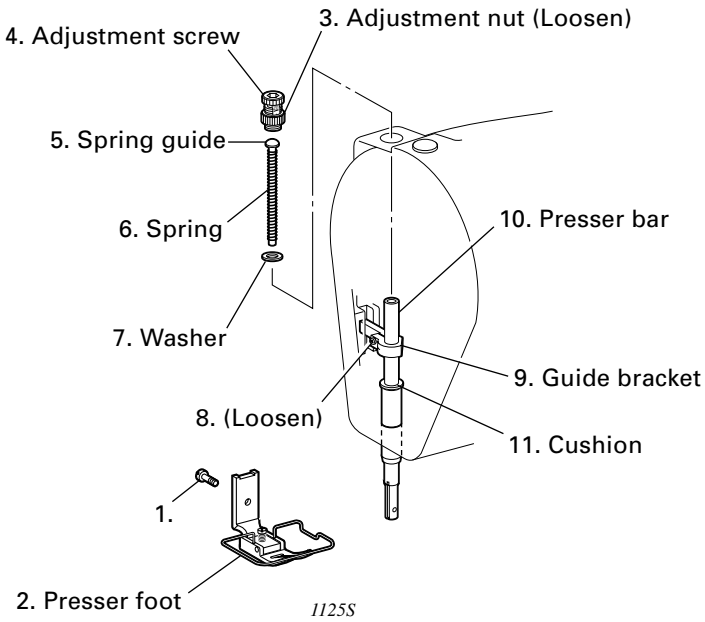
- Turn off the power switch before disassembly, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
  * When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.
- Disassembly of the sewing machine should only be carried out by a qualified technician.
- Use only the proper replacement parts as specified by Brother.
- Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation may result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they may cause vomiting and diarrhea.
  Keep the oil out of the reach of children
- If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.
- Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

Disassemble each part in order of the numbers.

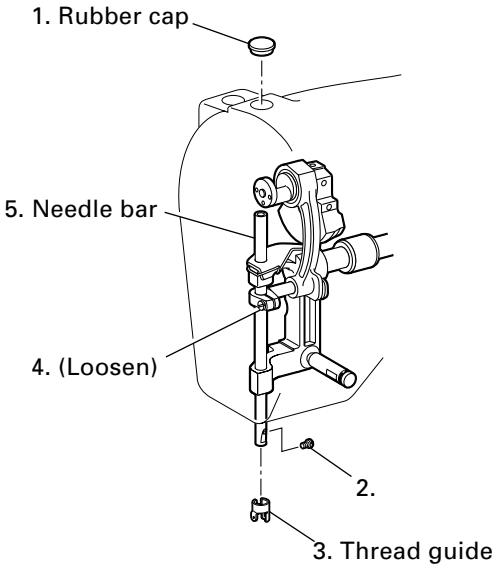
3-1. Cover

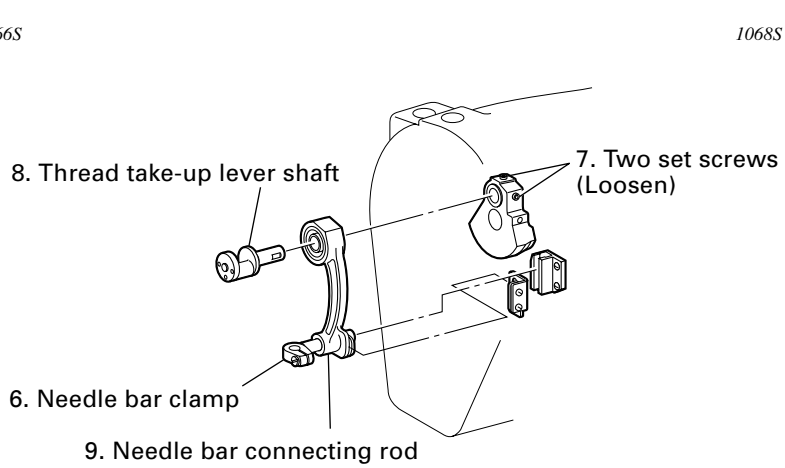


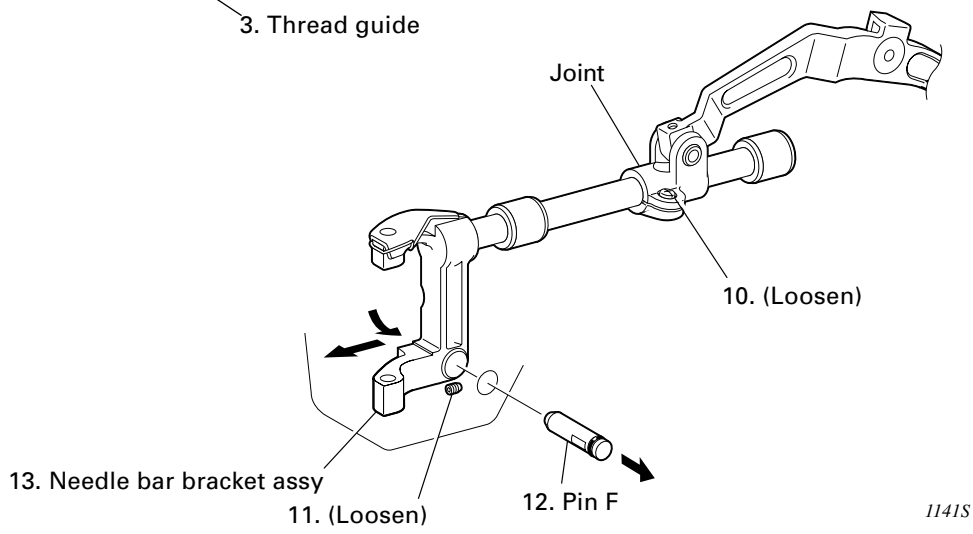
3-2. Presser mechanism



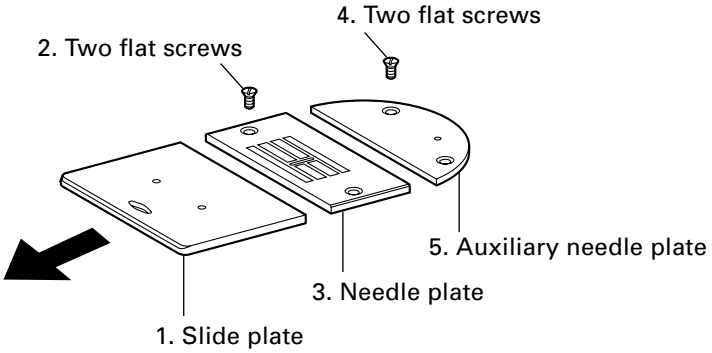
3-3. Needle bar mechanism



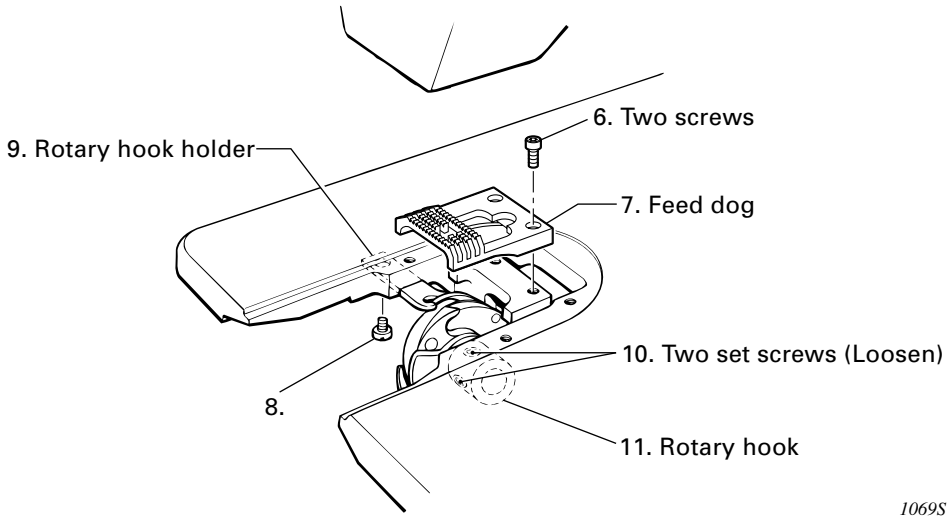




3-4. Rotary hook mechanism

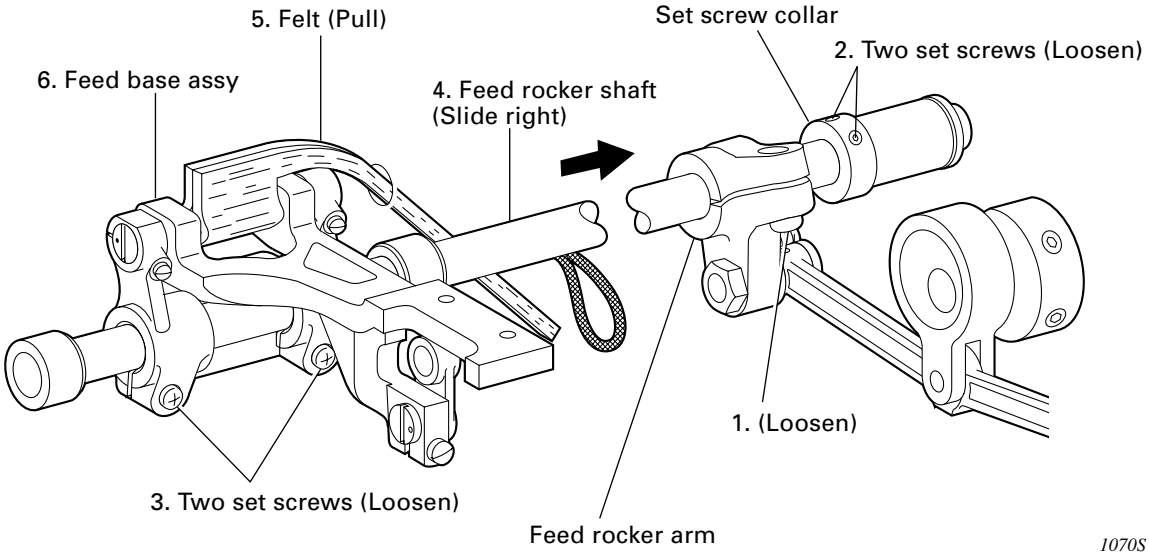


1075S



1069S

3-5. Feed mechanism

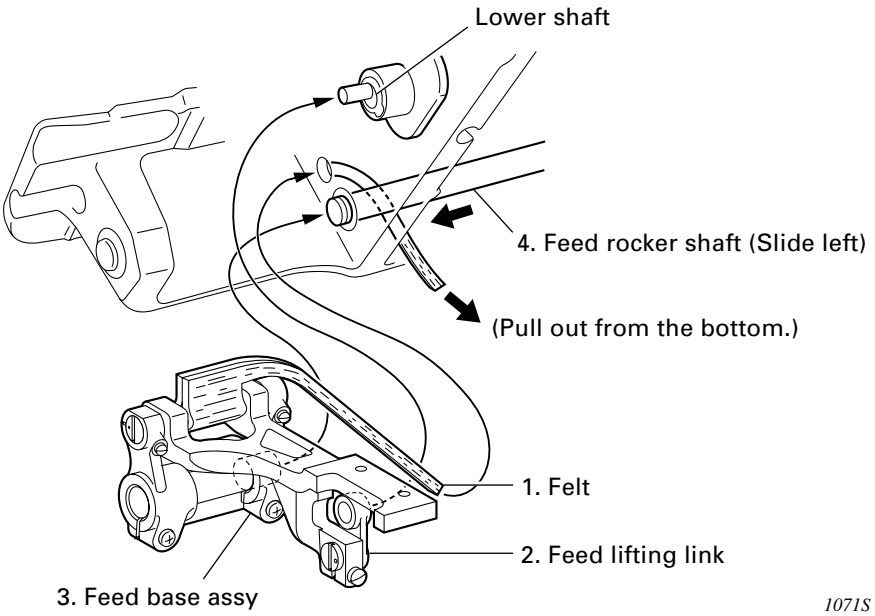


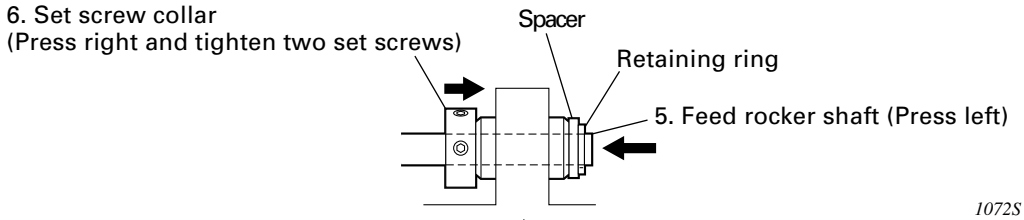
1070S

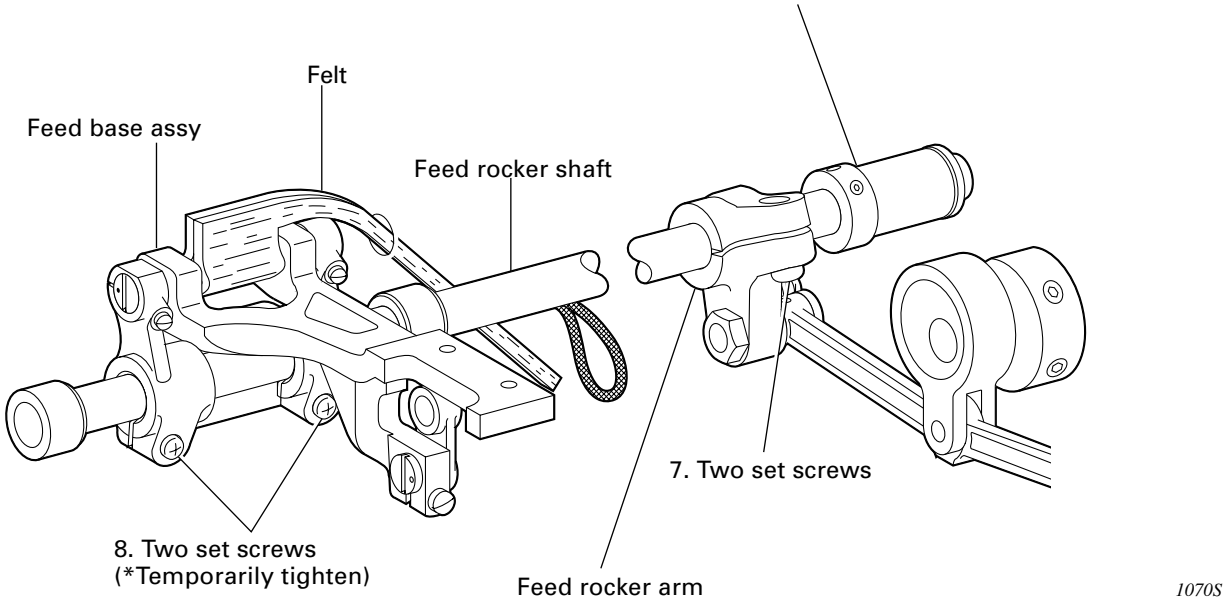
4.ASSEMBLY

Install each part in order of the numbers.

4-1. Feed mechanism

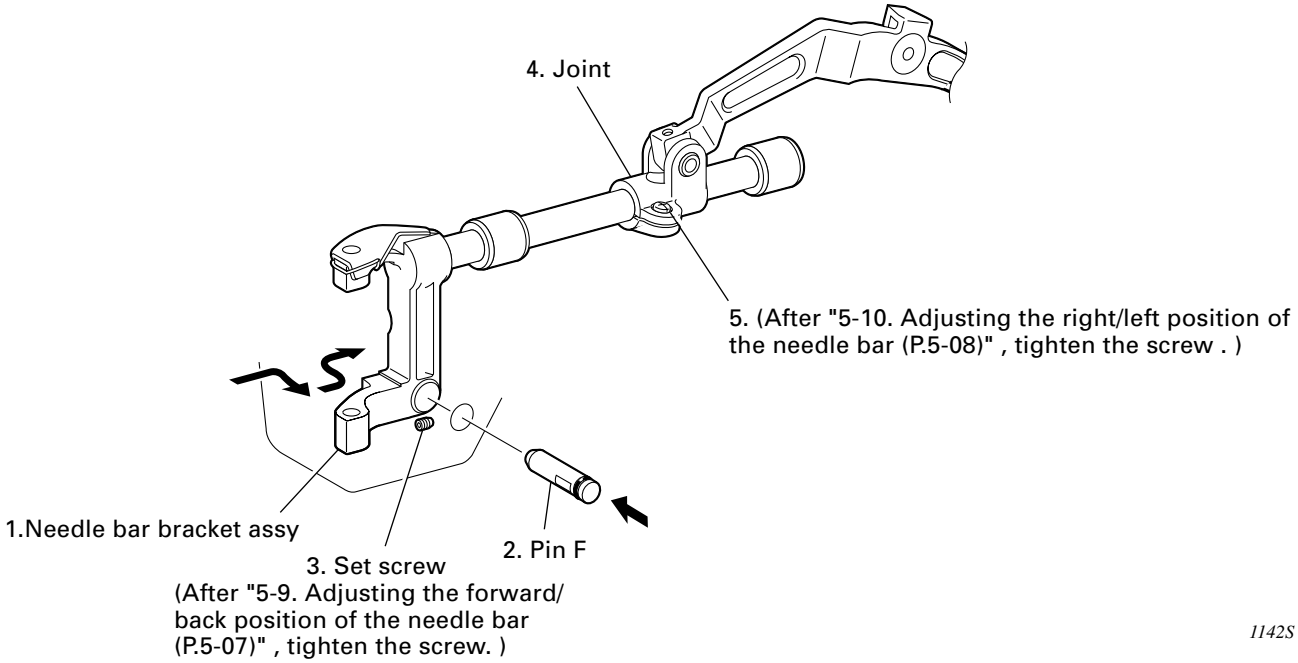




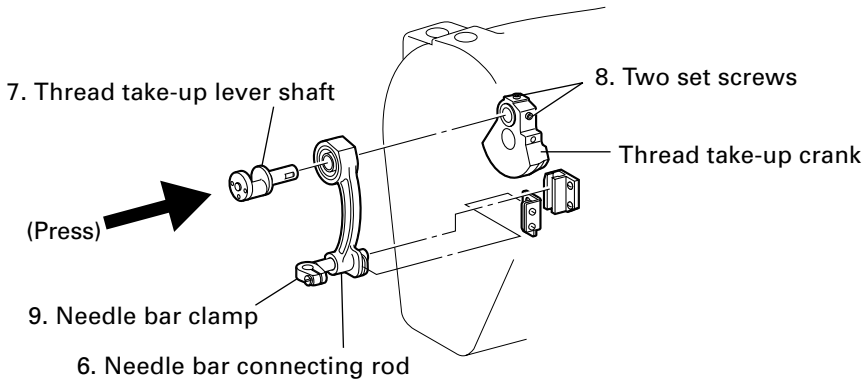


* After adjusting the feed dog, tighten the two screws.
Refer to "5-5. Adjusting the forward/back, right/left position of the feed dog" (page 5-03).

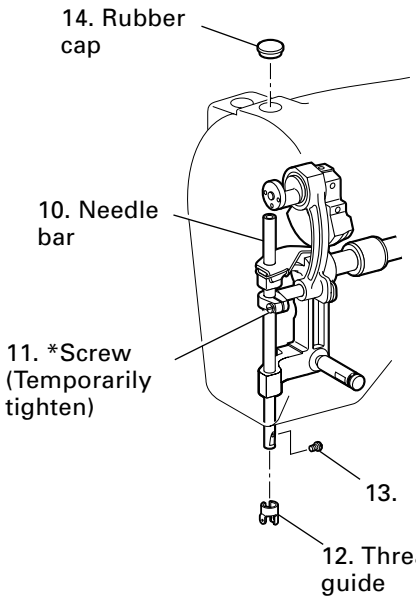
4-2. Needle bar mechanism


4. Joint
5. (After "5-10. Adjusting the right/left position of the needle bar (P.5-08)" , tighten the screw .)
1.Needle bar bracket assy
2. Pin F
3. Set screw
(After "5-9. Adjusting the forward/ back position of the needle bar (P.5-07)" , tighten the screw.)

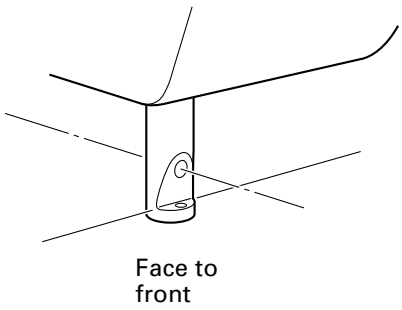
1142S



1068S



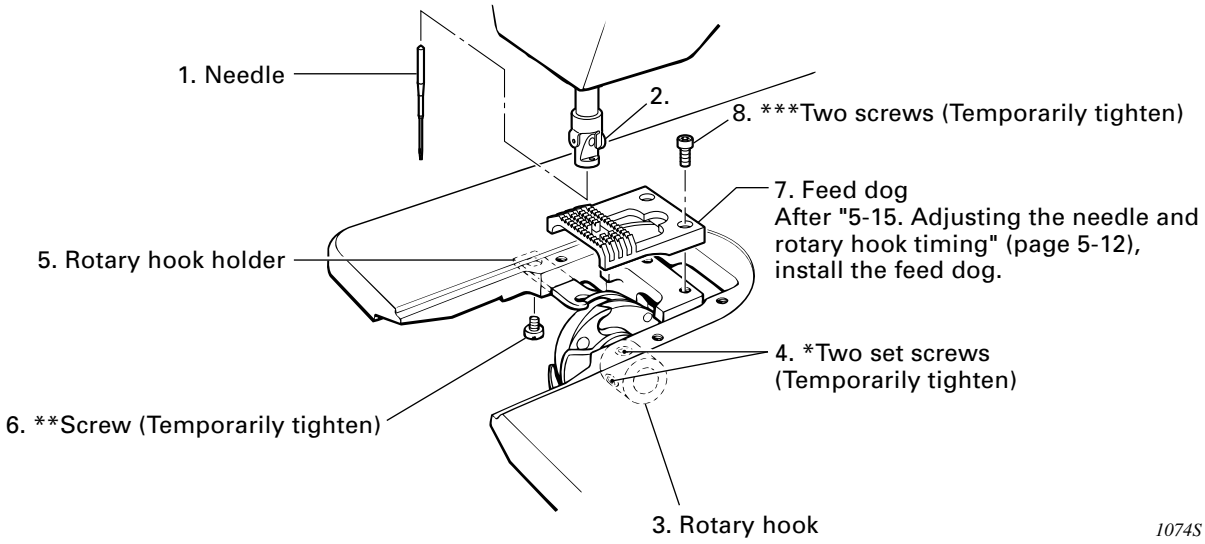
1066S

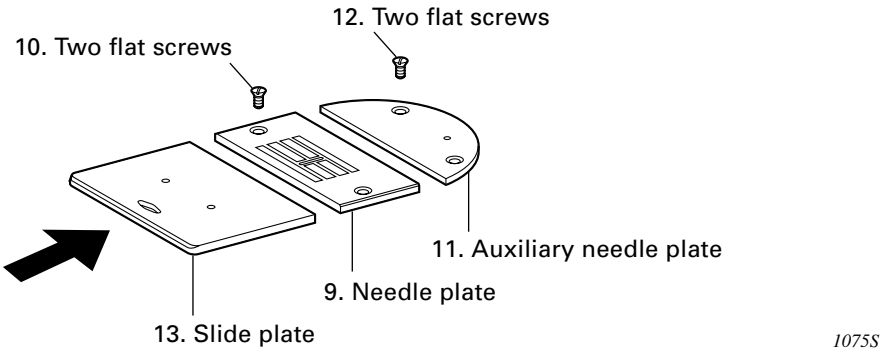


1073S

* Refer to "5-8. Adjusting the needle bar height" (page 5-06).

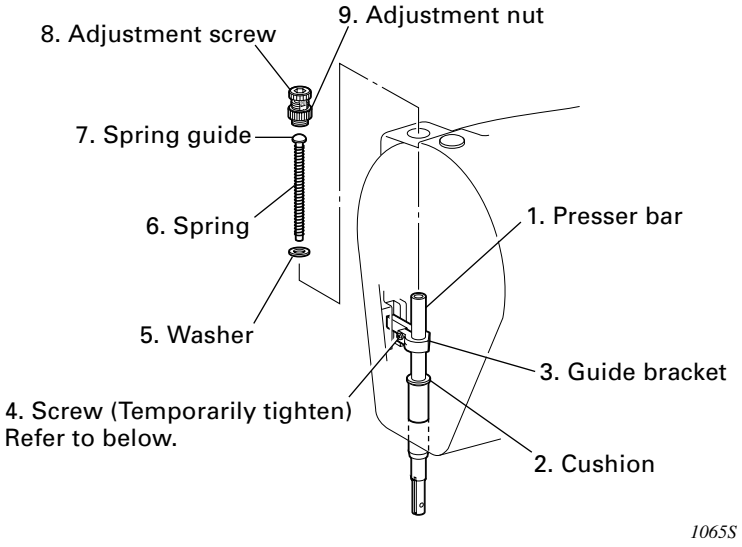
4-3. Rotary hook mechanism

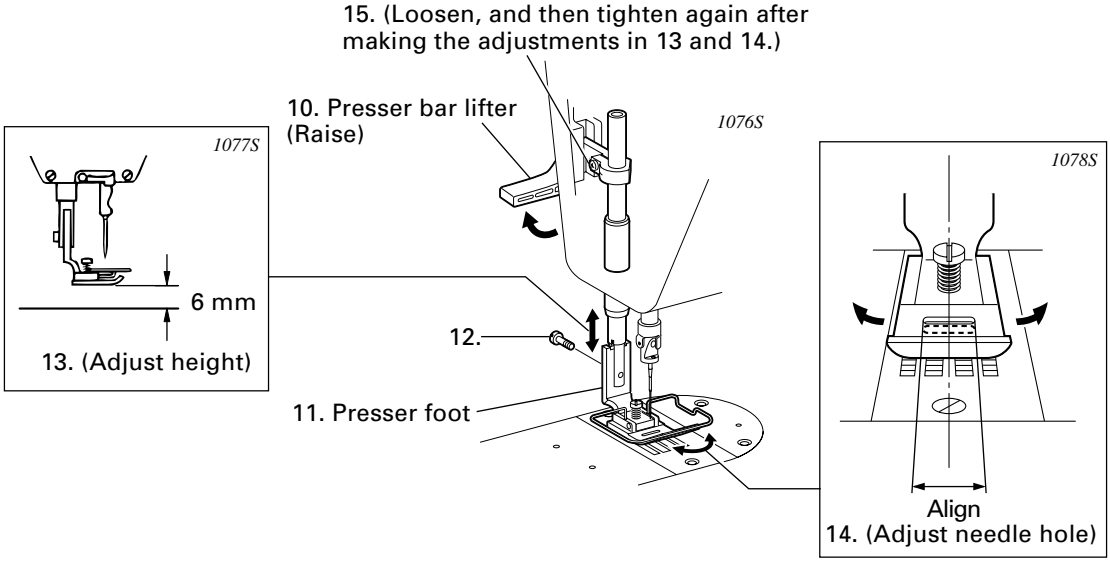

1. Needle
2.
8. ***Two screws (Temporarily tighten)
7. Feed dog
After "5-15. Adjusting the needle and rotary hook timing" (page 5-12), install the feed dog.
5. Rotary hook holder
4. *Two set screws (Temporarily tighten)
6. **Screw (Temporarily tighten)
3. Rotary hook
1074S

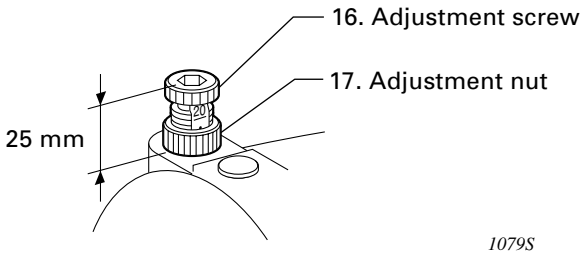


* After "5-15. Adjusting the needle and rotary hook timing" (page 5-12), tighten the two set screws.
** After "5-16. Adjusting the hook stopper position" (page 5-12), tighten the screw.
*** After "5-5. Adjusting the forward/back, right/left position of the feed dog" (page 5-03), tighten the two screws.

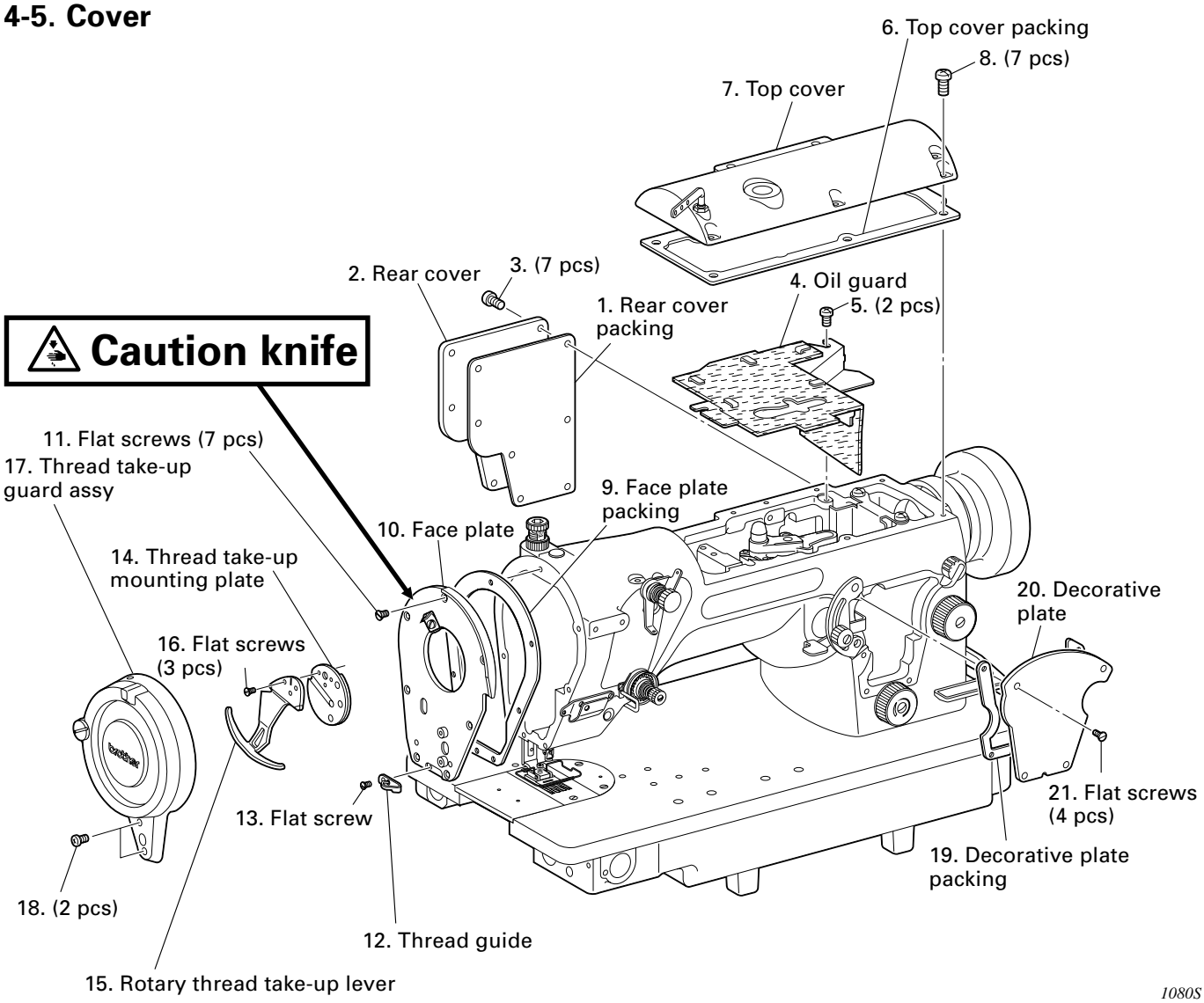
4-4. Presser mechanism







4-5. Cover


6. Top cover packing
8. (7 pcs)
7. Top cover
2. Rear cover
3. (7 pcs)
4. Oil guard
5. (2 pcs)
1. Rear cover packing
Caution knife
11. Flat screws (7 pcs)
17. Thread take-up guard assy
9. Face plate packing
10. Face plate
14. Thread take-up mounting plate
20. Decorative plate
16. Flat screws (3 pcs)
21. Flat screws (4 pcs)
13. Flat screw
19. Decorative plate packing
18. (2 pcs)
12. Thread guide
15. Rotary thread take-up lever
1080S

5. ADJUSTMENTS

⚠ CAUTION

Maintenance and inspection of the sewing machine should only be carried out by qualified personnel.

Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.

If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

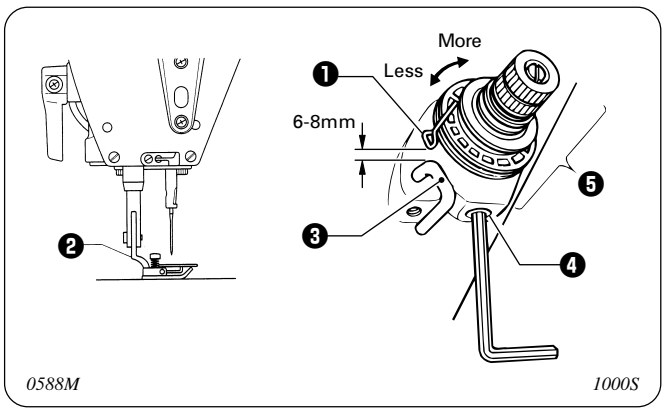
Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.

- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook

* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

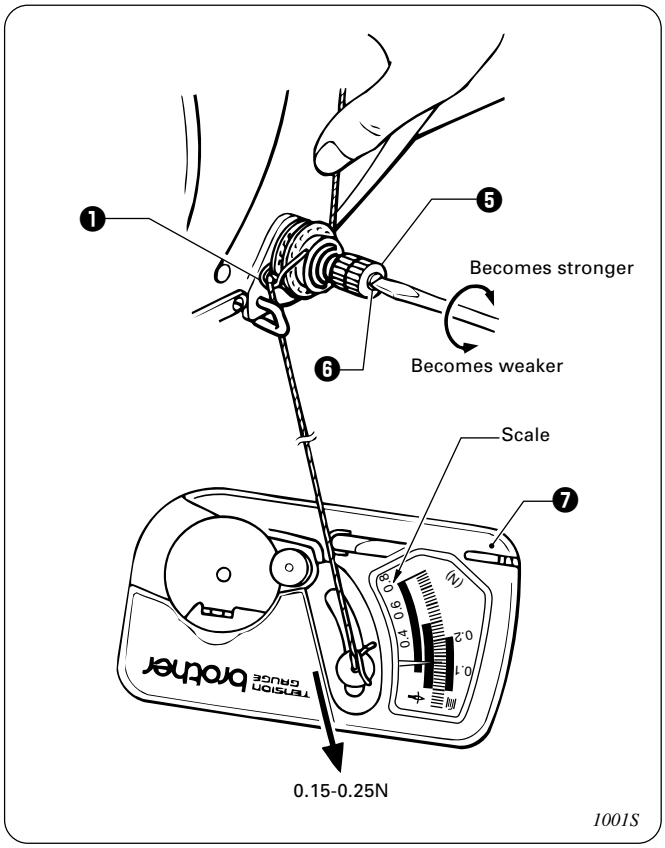
5-1. Adjusting the thread tension spring



<Thread tension spring position>

The standard position of the thread tension spring ❶ is 6 - 8 mm above the surface of the thread guide ❸ when the presser foot ❷ is lowered.

1. Lower the presser foot ❷.
2. Loosen the set screw ❹.
3. Turn the thread tension bracket ❺ to adjust the spring position.
4. Securely tighten the set screw ❹.



<Thread tension spring tension>

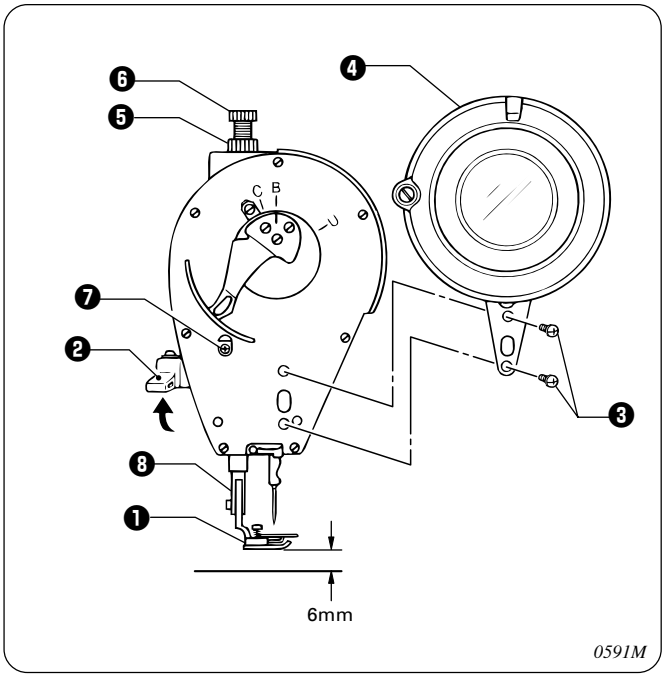
The standard tension of the thread tension spring ❶ is 0.15 to 0.25 N.

1. Press the upper thread slightly above the thread tension bracket ❺ with a finger to stop the thread spooling out.
2. Pull the upper thread down until the thread tension spring ❶ starts to move down, and measure the tension of the thread tension spring ❶ at this point.
3. Insert the tip of a screwdriver into the groove in the thread tension stud ❻ and turn it to adjust the tension of the thread tension spring ❶.

Note:

If using a tension gauge ❼ (sold separately) to measure the tension, take the reading from the scale on the side of the red line.

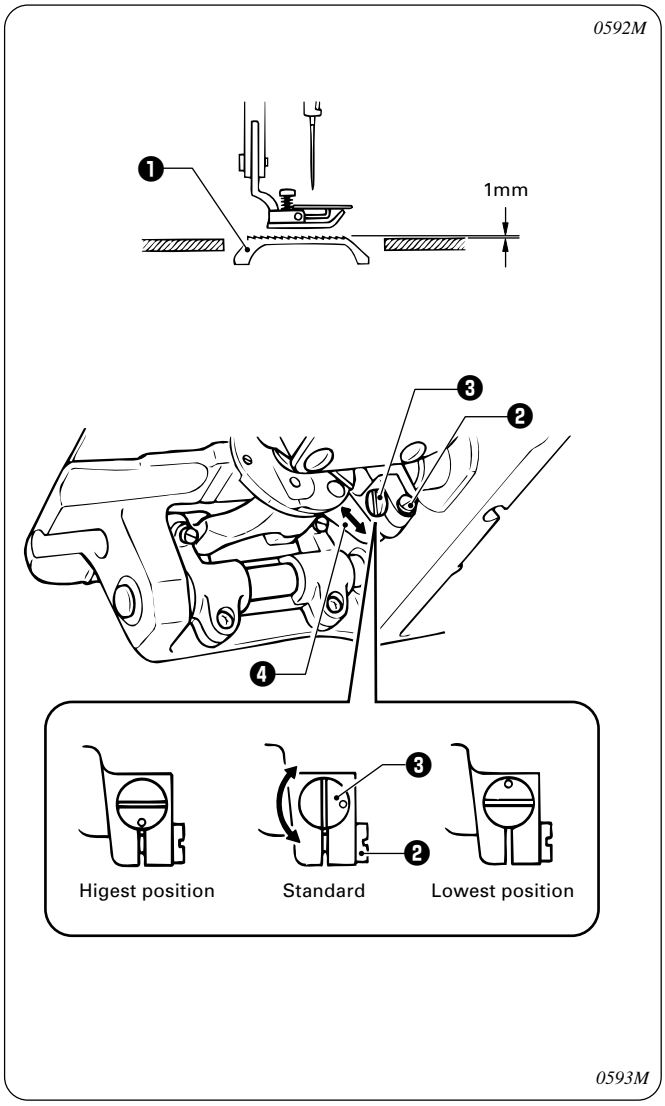
5-2. Adjusting the presser foot height



The standard height of the presser foot ❶ is 6 mm when the presser foot ❶ is raised by means of the presser bar lifter ❷.

1. Remove the two screws ❸ and then remove the thread take-up guard ❹.
2. Loosen the nut ❺ of the adjustment screw ❻ , and then turn the adjustment screw ❻ so that there is no pressure applied to the presser foot.
3. Raise the presser bar lifter lever ❷. The presser foot ❶ will also rise.
4. Loosen the screw ❼ and move the presser bar ❽ up and down to adjust the height of the presser foot ❶ to 6 mm.
5. Tighten the bolt ❼.
6. Adjust the presser foot pressure using the adjustment screw ❻, and then tighten the nut ❺.
7. Install the thread take-up guard ❹ with the two screws ❸.

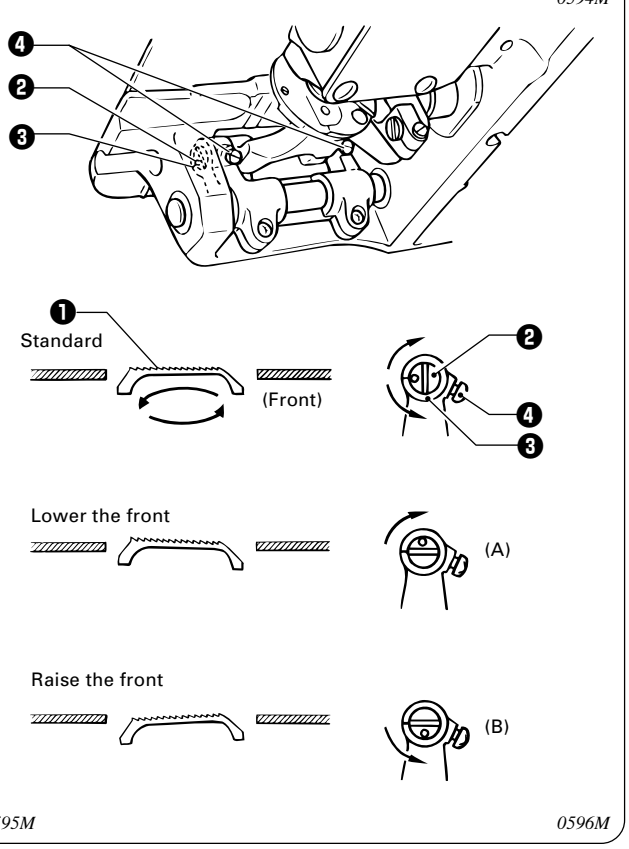
5-3. Adjusting the feed dog height



The standard height when the feed dog ❶ is at its highest position above the needle plate is 1 mm.

1. Turn the machine pulley to move the feed dog ❶ to its highest position above the needle plate.
2. Tilt back the machine head.
3. Loosen the screw ❷.
4. Turn the pin ❸ to move the feed bar ❹ up and down in order to adjust the height.
5. Securely tighten the screw ❷.

5-4. Adjusting the feed dog angle

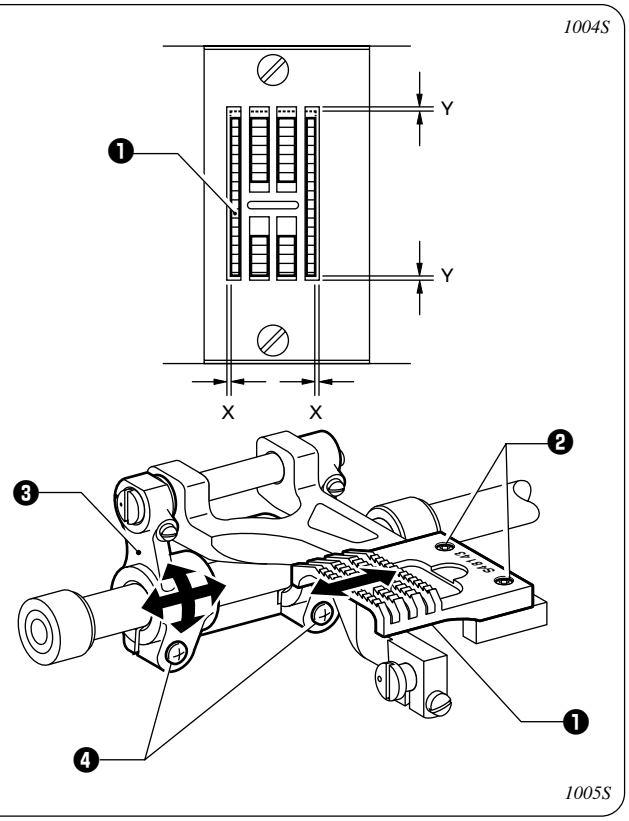


The standard angle for the feed dog ❶ is for the top of the needle plate and the top of the feed dog ❶ to be parallel when the feed dog ❶ is at its maximum height above the needle plate.(with the ● mark on the feed bracket shaft ❷ aligned with the mark on the feed rocker bracket arm ❸).

1. Turn the machine pulley to move the feed dog ❶ to its highest position above the needle plate.
2. Tilt back the machine head.
3. Loosen the two set screws ❹.
4. Turn the feed bracket shaft ❷ in the direction of the arrow within a range of 90° with respect to the standard position.
   - Tilting the feed dog ❶ so that the front is lowered tends to prevent puckering(gathering). (Figure A)
   - Tilting the feed dog ❶ so that the front is raised tends to prevent material from slipping (uneven material feeding). (Figure B)
5. Securely tighten the set screws ❹.

* When the angle of the feed dog ❶ is adjusted, the height and forward/back position of the feed dog ❶ will also change and will need to be readjusted.

5-5. Adjusting the forward/back, right/left position of the feed dog

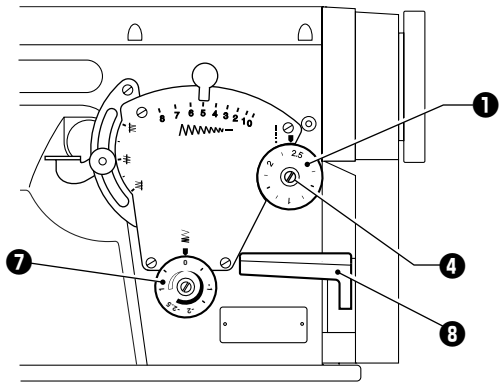


Adjust the clearances X at the left and right sides of the feed dog ❶ and the needle plate so that they are as close as possible to being equal.
Adjust the clearances Y at the front and rear ends of the feed dog ❶ and the needle plate so that they are as close as possible to being equal when the machine pulley is turned so that the needle plate is at is furthest position forward and furthest position back.

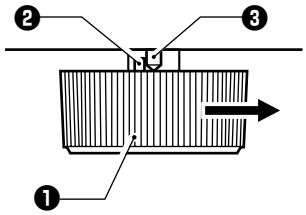
<Adjusting the left and right clearances X>
Loosen the two screws ❷ of the feed dog ❶ and adjust.
If adjustment is not possible, carry out the following adjustment.

<Adjusting the front and back clearances Y and the left and right clearances X>
Loosen the two screws ❹ of the level feed arm ❸ and adjust.

5-6. Adjusting the stitch length



1048S



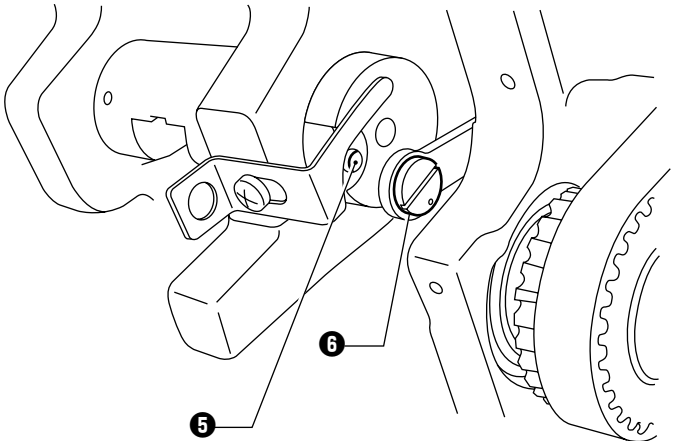
1007S

The feed amount is set by means of the feed adjustment dial ❶.
The scale is a guide only; if the length of the finished stitches differs greatly from the scale value, make the following adjustment.

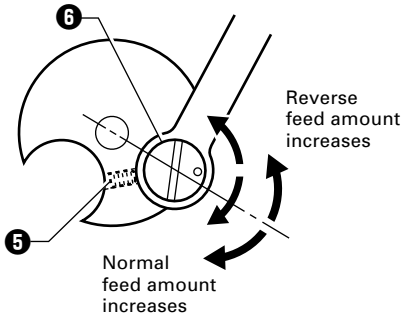
1. Turn the feed adjustment dial ❶ clockwise as far as it will go so that the stopper ❷ touches the pin ❸.
2. Push the pin ❸ using a screwdriver or similar tool to separate it from the stopper ❷, and check that the feed adjustment dial ❶ cannot be turned any further clockwise even when this is done.
   If the feed adjustment dial can be turned further, turn it until it cannot turn any further.
   Loosen the screw ❹, turn only the dial section of the feed adjustment dial ❶ so that the stopper ❷ touches the pin ❸, and then tighten the screw ❹.

<If adjusting the forward feed amount and reverse feed amount so that they are the same>

Specification	Scale position	Feed amount per 10 stitches
-1 (Max. stitch length 2.5mm) 1008S	1.5	15mm
-3 (Max. stitch length 5mm) 1009S	3	30mm



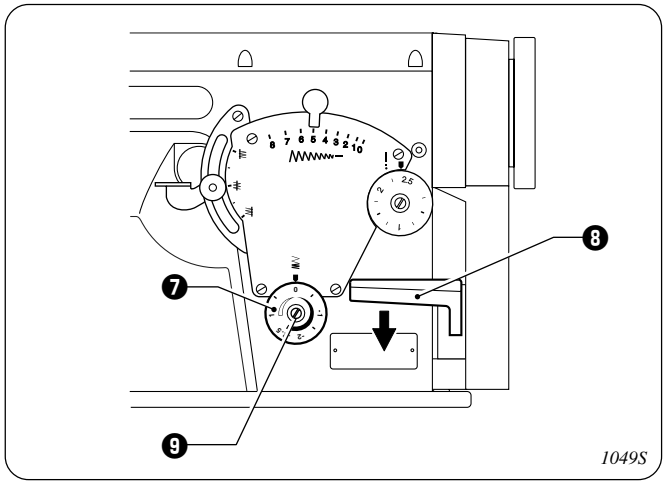
1010S



1011S

3. Set the feed adjustment dial ❶ as indicated in the table.
4. Turn the condensed stitch adjustment dial ❼ counterclockwise as far as it will go.
5. Adjust the feed amount so that the length of material fed after 10 stitches (after the machine pulley rotates 11 times) and the length of reverse feed when the reverse lever ❽ is pressed (after the machine pulley rotates 11 times) match the distances given in the table.
6. Loosen the set screw ❺ and turn the eccentric pin ❻ to adjust the feed amount.

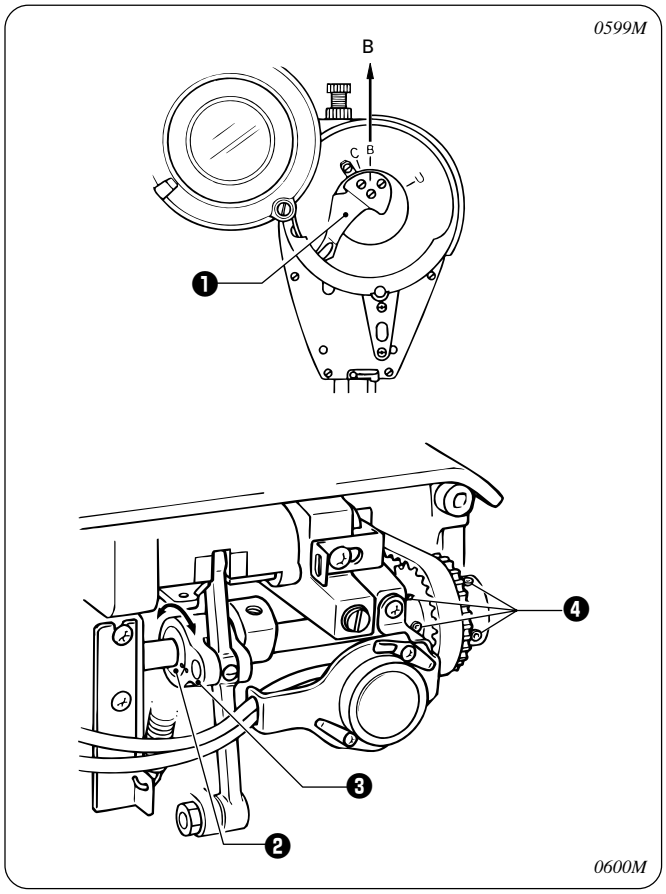
* After adjusting, carry out the "<Backtacking and condensed stitches>" adjustment in the next section also.



<Backtacking and condensed stitches>
The feed amount for backtacking and condensed stitches is set by means of the condensed stitch adjustment dial ❼.
The scale is a guide only; if the length of the finished stitches differs greatly from the scale value, make the following adjustment.
In addition, carry out the following adjustment when adjusting the forward feed amount and reverse feed amount so that they are the same.

1. Set the condensed stitch adjustment dial ❼ to the "0" position.
2. While keeping the backtack lever ❽ pressed down, turn the machine pulley about 10 times and check that the material feed amount is zero.
   If the material feed amount is not zero, make the following adjustment.
3. Turn the condensed stitch adjustment dial ❼ so that it is slightly to the left or the right of the "0" position.
   Repeat steps 2. and 3. until the zero position for the material feed amount is located.
4. When the zero position for the material feed amount has been located, loosen the screw ❾, turn only the dial section of the condense stitch adjustment dial ❼ to the "0" position, and then re-tighten the screw ❾.

5-7. Adjusting the needle and feed mechanism timing

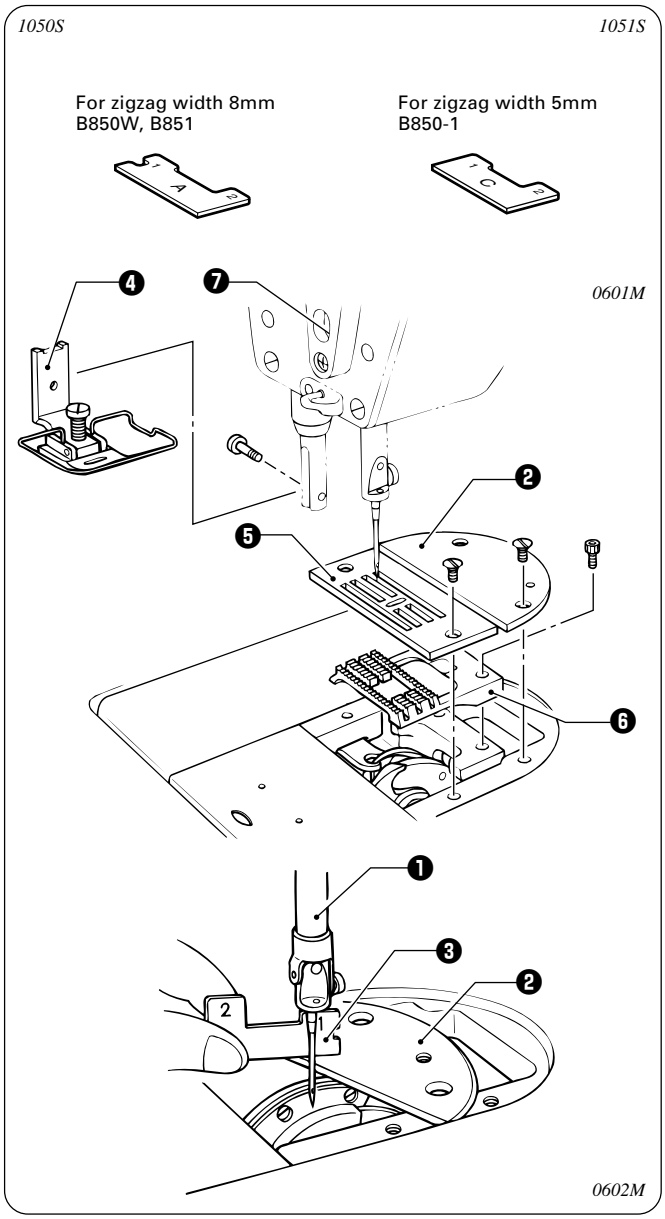


The ● mark on the level feed eccentric wheel ❷ should be aligned with the ● mark on the connecting rod ❸ when the reference line on the thread take-up lever ❶ is aligned with the B mark on the face plate.

1. Tilt back the machine head.
2. Align the reference line on the thread take-up lever ❶ with the B mark on the face plate.
3. Loosen the four screws ❹.
4. Turn the level feed eccentric wheel ❷ to align the ● mark with the ● mark on the connecting rod ❸.
5. Securely tighten the four screws ❹.

* If the needle and feed timing has been adjusted, you should also adjust “5-15. Adjusting the needle and rotary hook timing”. (Refer to page 5-12.)

5-8. Adjusting the needle bar height



When the needle bar ❶ is at its lowest position, the distance from the top of the auxiliary needle plate ❷ to the bottom edge of the needle bar ❶ should be the same as the height of accessory timing gauge 1 ❸.

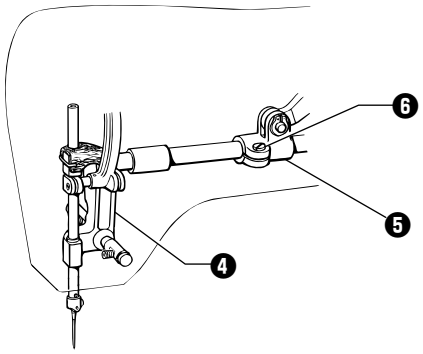
1. Remove the presser foot ❹, needle plate ❺, auxiliary needle plate ❷ and feed dog ❻ .
2. Place the auxiliary needle plate ❷ on the needle plate installation surface of the machine bed.
3. Turn the machine pulley to move the needle bar ❶ to its lowest position.
4. Loosen the screw ❼.
5. Move the needle bar ❶ up or down to adjust the distance from the top of the auxiliary needle plate ❷ to the bottom edge of the needle bar ❶ so that it is the same as the height of accessory timing gauge 1 ❸.
   Note:
   The needle plate ❺ and the auxiliary needle plate ❷ are of different thicknesses, so be sure to use the auxiliary needle plate ❷.
6. Securely tighten the screw ❼.
7. Install the presser foot ❹, needle plate ❺, auxiliary needle plate ❷ and feed dog ❻ .

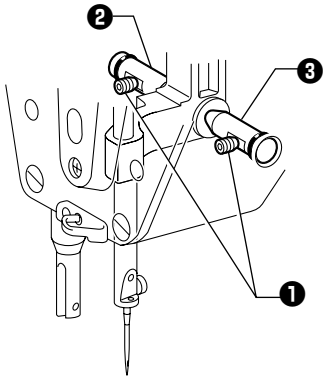
* When adjusting the needle bar height, be sure to adjust “5-15. Adjusting the needle and rotary hook timing” also. (Refer to page 5-12.)

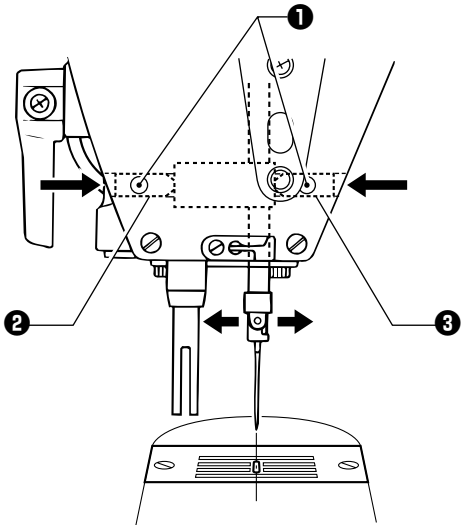
* When remove the feed dog. be sure to adjust “5-5. Adjusting the forward/back, right/left position of the feed dog”. (Refer to page 5-03.)

5-9. Adjusting the forward/back position of the needle bar

1120S







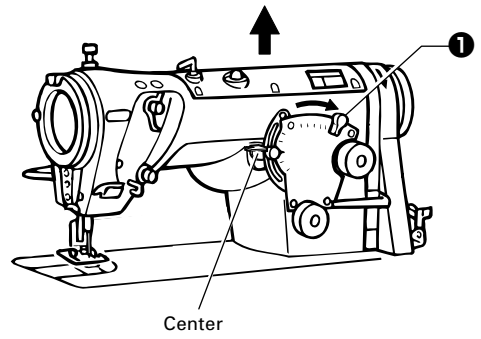
1047S 1014S

* Make this adjustment if the needle bar bracket assembly ❹ and joint ❺ are not fixed securely.
Loosen the screw ❻ while making this adjustment.
Adjust so that the needle is in the center of the needle plate hole at equal distances from the front and rear edges of the hole.
When adjusting, also make sure that there is no longitudinal play in the needle bar and that it moves smoothly when zigzagging.

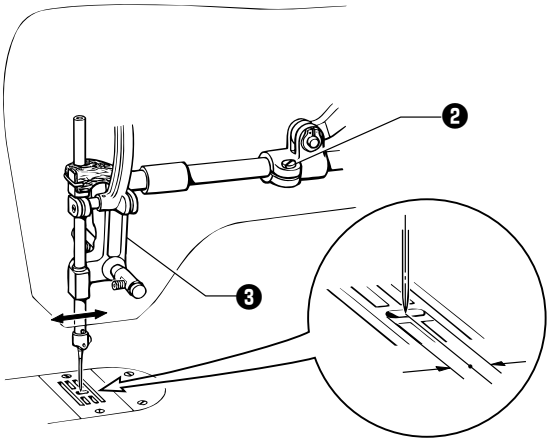
1. Remove the presser foot while making this adjustment.
2. Loosen the two set screws (hexagonal screws 2 mm diagonally opposite each other) ❶, and then push pin R ❷ or pin F ❸ to adjust.
   Turn the machine pulley and check that the needle moves down into the center of the needle plate hole.
3. Securely tighten the two screws ❶.

* After adjusting, check that there is no longitudinal play in the needle bar and that it moves smoothly when zigzagging.
* After making this adjustment, you should also carry out the adjustment in "5-10. Adjusting the right/left position of the needle bar" (Page 5-08).

5-10. Adjusting the right/left position of the needle bar



1052S

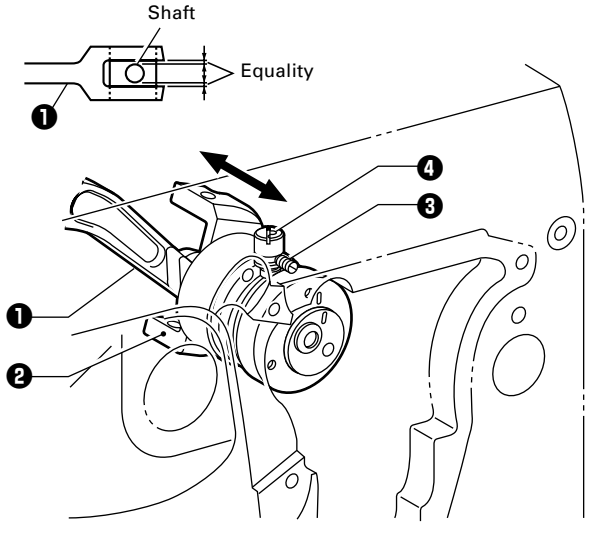


1053S

With the change lever in the center position so that the zigzag width is zero, adjust so that the needle is in the center of the needle plate hole.

1. Remove the head cover while making this adjustment. Set the zigzag width lever ❶ to the "0" position.
2. Loosen the screw ❷ and move the needle bar bracket assembly ❸ to the left or right to adjust.
   Turn the machine pulley and check that the needle moves down into the center of the needle plate hole.
3. Securely tighten the screw ❷.

5-11. Adjusting the forward/back position of the zigzag regulator

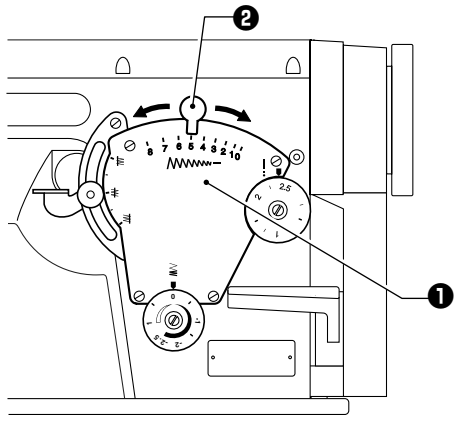


1054S

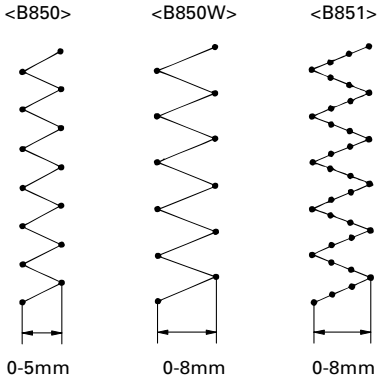
Adjust so that the needle bar rocking lever ❶ and the zigzag adjuster ❷ move easily.

1. Remove the head cover, the oil guard and the decorative plate, while making this adjustment.
2. Loosen the set screw ❸ and turn the eccentric positioning shaft ❹ to adjust.
   Adjust the clearances at the needle bar rocking lever ❶ and the shaft of the zigzag adjuster ❷ so that they are as close as possible to being equal.

5-12. Adjusting the base position of the zigzag width



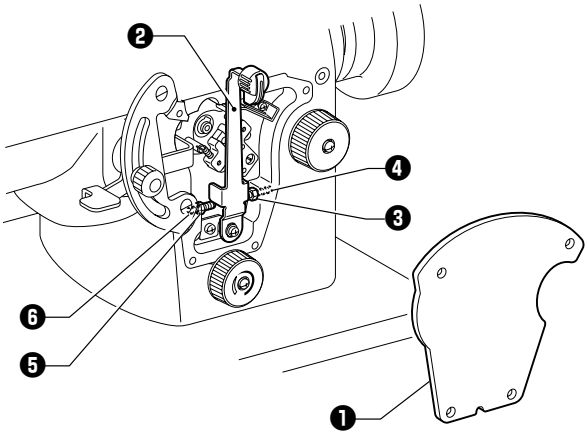
0560M



0561M

* Raise the needle above the material when adjusting the zigzag width. If the zigzag width is adjusted while the needle is piercing the material, the needle may bend.

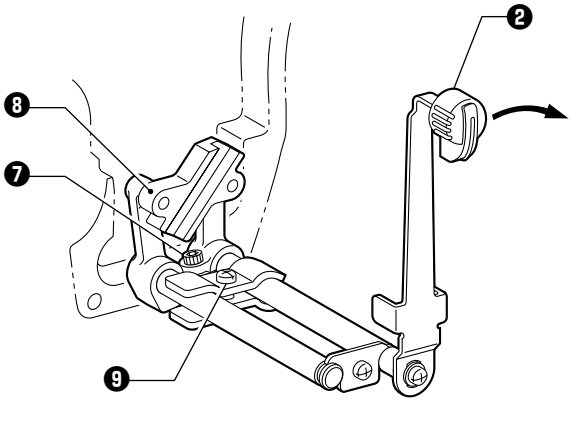
The numbers on the scale of the decorative plate ❶ indicate the zigzag width in mm.
The scale is a guide only; if the width of the finished zigzag stitches differs greatly from the scale value, make the following adjustment.



1055S

Adjust the position of the zigzag width lever ❷.

1. Remove the decorative plate ❶ while making this adjustment.
2. Move the zigzag width lever ❷ all the way to the right (the side where the zigzag width becomes zero).
3. Adjust so that the zigzag width lever ❷ is at the "0" position on the scale of the decorative plate ❶.
   Loosen the nut ❸ and turn the set screw ❹ to adjust.
4. Next, Move the zigzag width lever ❷ all the way to the side where the zigzag width becomes the largest.
5. Adjust so that the zigzagging movement of the needle is at the greatest width (5 mm for the B850, 8 mm for the B850W and B851).
   Loosen the nut ❺ and turn the set screw ❻ to adjust.



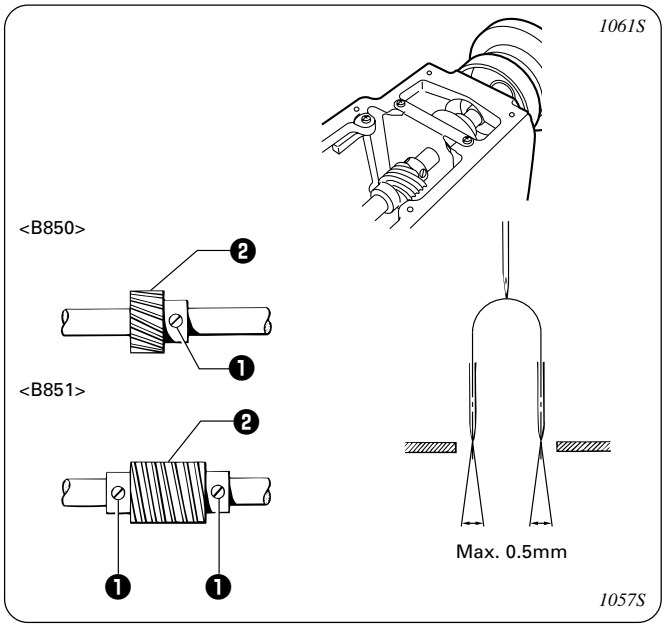
1056S

If the above adjustment is not possible, adjust the zigzag width zero position.

1. Remove the head cover, the oil guard and the rear cover while making this adjustment.
2. Set the zigzag width lever ❷ to the zigzag width zero position.
3. Adjust so that the needle does not move sideways at all when the machine pulley is turned.
   Loosen the screw ❼ and change the angle of the crank assembly ❽ to adjust.

* If the zigzag width lever ❷ is moved while the sewing machine is operating, or if it is stiff and cannot be moved easily, adjust by turning the screw ❾.
The optimum stiffness for the zigzag width lever ❷ is 29.4-39.2 N (for the B850) or 19.6-29.4 N (for the B851) at the lever knob.

5-13. Adjusting the needle sidewise movement

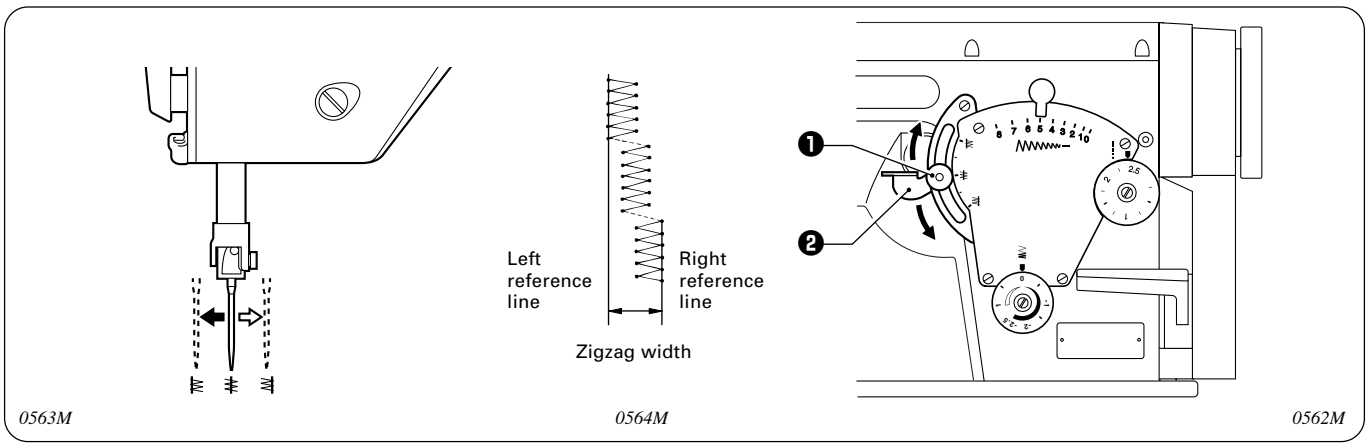


Adjust so that the amount of needle deflection when the needle goes into the needle plate hole is as small as possible.

1. Remove the head cover and the oil guard while making this adjustment.
2. Loosen the screws ❶ (two for the B850, four for the B851) and turn the upper shaft gear ❷ to adjust.

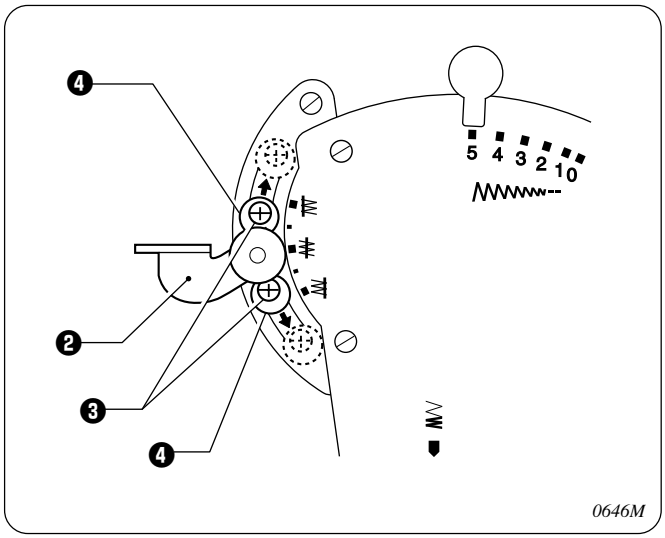
* Adjust so that the needle path describes a reversed "U" shape when the machine pulley is turned.

5-14. Adjusting the change lever (the needle base position).



* Raise the needle above the material when adjusting the zigzag width. If the zigzag width is adjusted while the needle is piercing the material, the needle may bend.

To change the reference line, loosen the thumb nut ❶ and move the change lever ❷ up or down.



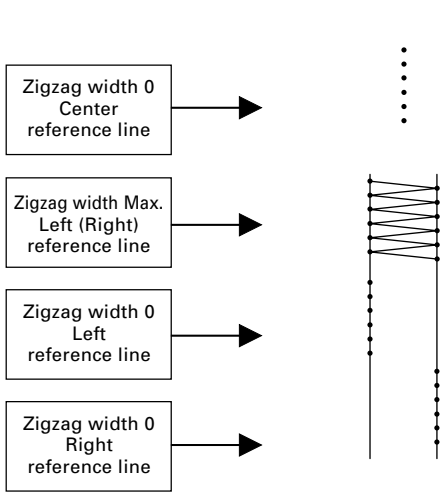
* For B850-1 (Narrow specifications)

Note:

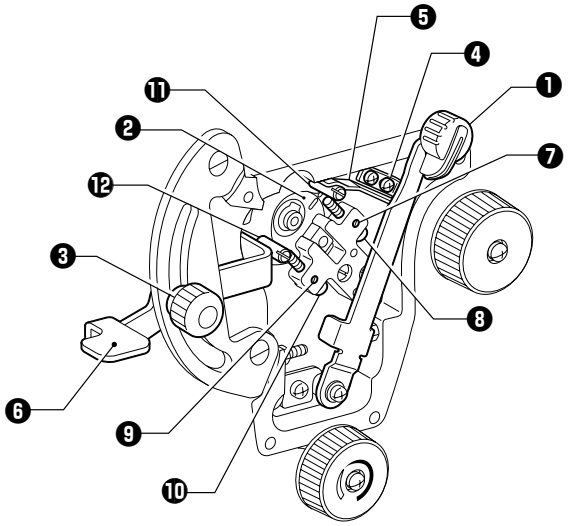
If the needle position is set outside the center reference line, turn the machine pulley by hand to check that the needle does not touch the presser foot and the needle plate before sewing.

To change the reference line, first loosen the two screws ❸, and then move the two stoppers ❹ of the change lever ❷. Next loosen the thumb nut ❶ and move the change lever ❷ up or down.

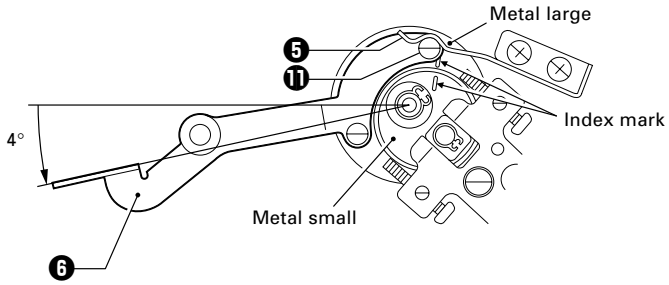
<B850>



1058S



1059S



1062S

The left and right reference lines should be adjusted so that when the zigzag width is zero, the left reference line and the right reference line are aligned with the left and right needle down positions when the zigzag width is set to the maximum width.

1. Remove the decorative plate while making this adjustment.
2. Set the zigzag width lever (1) to the zigzag width zero position.

<Center reference line adjustment>

3. With the index marks on the large bushing and small bushing of the zigzag selector ❷ aligned with each other, tighten the screw ❶❶ so that it is seated in the recess of the needle positioning plate ❺.
   (The change lever will drop four steps.)
   Loosen the thumb nut ❸, loosen the screw ❹, and then move the needle positioning plate ❺ to move the change lever ❻ in order to adjust the center reference line.

* After making this adjustment, you should also carry out the adjustment in "5-10. Adjusting the right/left position of the needle bar" (page 5-08).

<Left and right reference line adjustment>

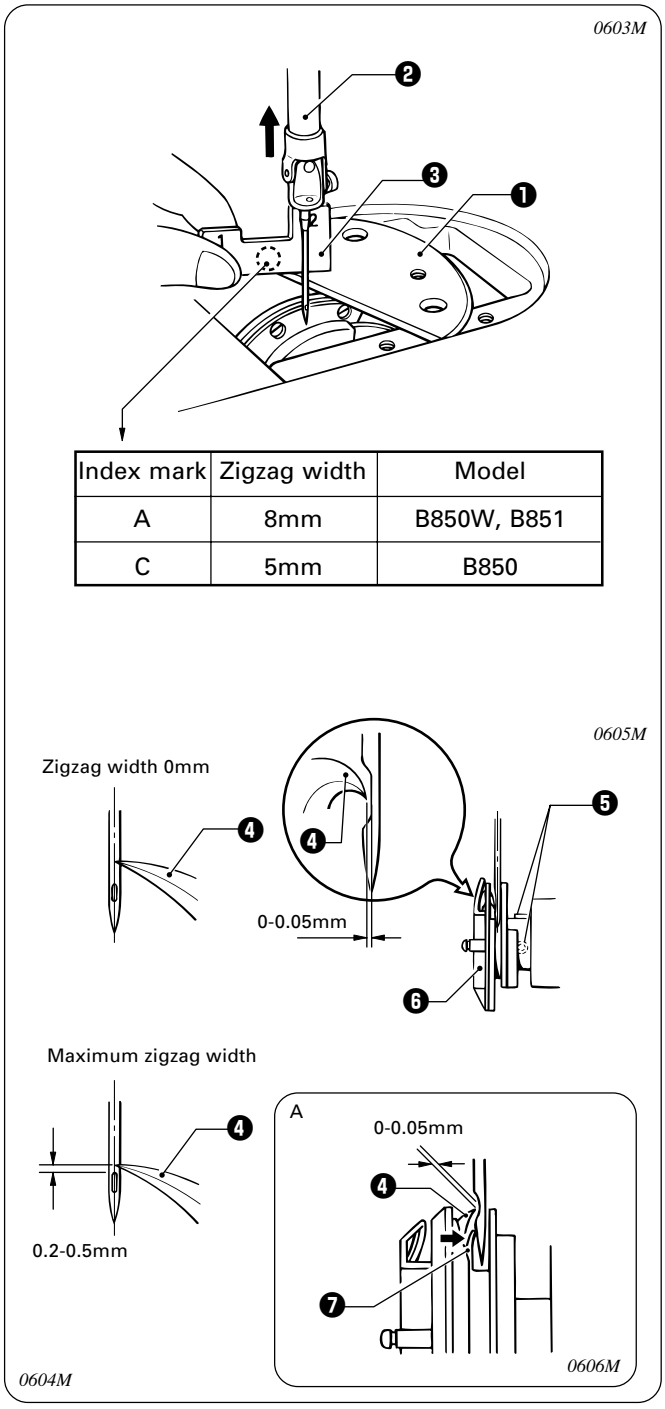
4. Loosen the set screw ❼ and turn the screw ❽ to adjust the left reference line.
   Loosen the set screw ❾ and turn the screw ❿ to adjust the right reference line.

* The adjustment amount for the change lever ❻ should be set within the range so that the screws ❶❶ and ❶❷ do not touch the ends of the screws ❽ and ❿.

Note:

Turn the machine pulley by hand to check that the needle does not touch the presser foot and the needle plate at each reference line before sewing.

5-15. Adjusting the needle and rotary hook timing



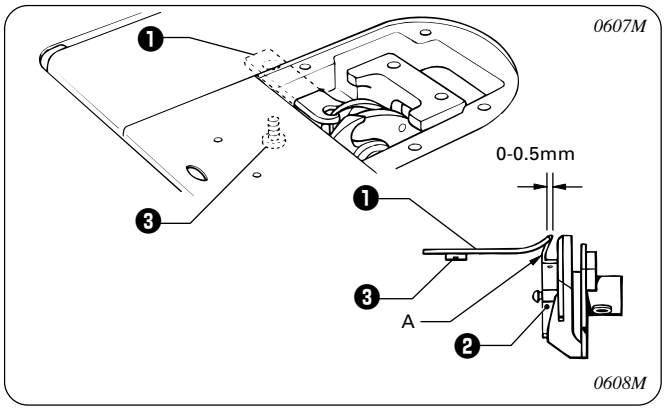
Index mark	Zigzag width	Model
A	8mm	B850W, B851
C	5mm	B850

1. Set the zigzag width to "0", and set the needle position to the center reference line. (Refer to P. 29 – 31.)
2. Remove the presser foot, needle plate, auxiliary needle plate and feed dog.(Refer to P. 5-06.)
3. Place the auxiliary needle plate ❶ on the needle plate installation surface of the machine bed.
4. Turn the machine pulley to move the needle bar ❷ from its lowest position, and check the following when the distance from the top of the auxiliary needle plate ❶ to the bottom edge of the needle bar ❷ is the same as the height of accessory timing gauge 2 ❸.
   - The tip of the rotary hook ❹ should be aligned with the center of the needle.
   - The distance from the tip of the rotary hook ❹ to the needle should be 0 to 0.05 mm.

   Note:
   The needle plate and the auxiliary needle plate ❶ are of different thicknesses, so be sure to use the auxiliary needle plate ❶.
5. If the above are not correct, loosen the two screws ❺ and adjust the position of the rotary hook ❻.
   After adjustment, securely tighten the two screws ❺.
6. Set the zigzag width to the maximum setting.
   - B850.....5mm
   - B850W, B851.....8mm

7. Turn the machine pulley to move the needle to its furthest left position so that the tip of the rotary hook ❹ is aligned with the center of the needle, and check that the distance from the upper edge of the needle hole to the tip of the rotary hook ❹ is 0.2 to 0.5 mm at this time.
   * If the distance is not correct, adjust the height of the needle bar. (Refer to page 5-06.)
8. If needle deflection occurs when sewing material with joints, bend the needle guard ❼ in the direction of the arrow as shown in the illustration A so that it touches the needle.
   * After this, check that the clearance between the tip of the rotary hook ❹ and the needle is 0 to 0.05 mm.

5-16. Adjusting the hook stopper position



Adjust so that the end of the rotary hook holder ❶ is 0 to 0.5 mm back from end A of the inner rotary hook ❷.

* The end of the rotary hook holder ❶ must never extend to the right of end A of the inner rotary hook ❷.

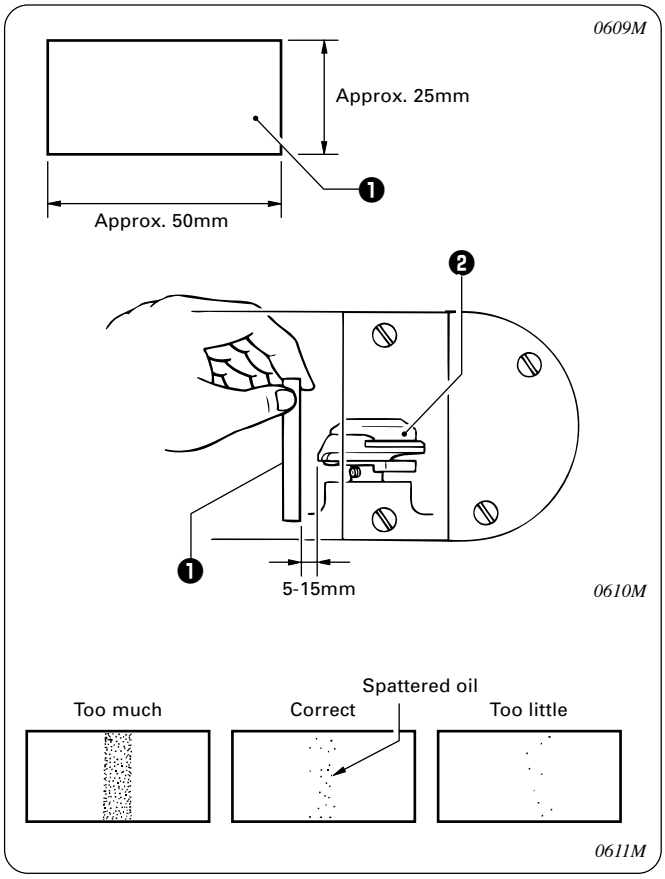
1. Loosen the screw ❸ and adjust the position of the rotary hook holder ❶.
2. Securely tighten the screw ❸.

5-17. Adjusting the rotary hook lubrication amount

⚠ CAUTION

Be careful not to touch your fingers or the lubrication amount check sheet against moving parts such as the rotary hook or the feed mechanism when checking the amount of oil supplied to the rotary hook, otherwise injury may result.

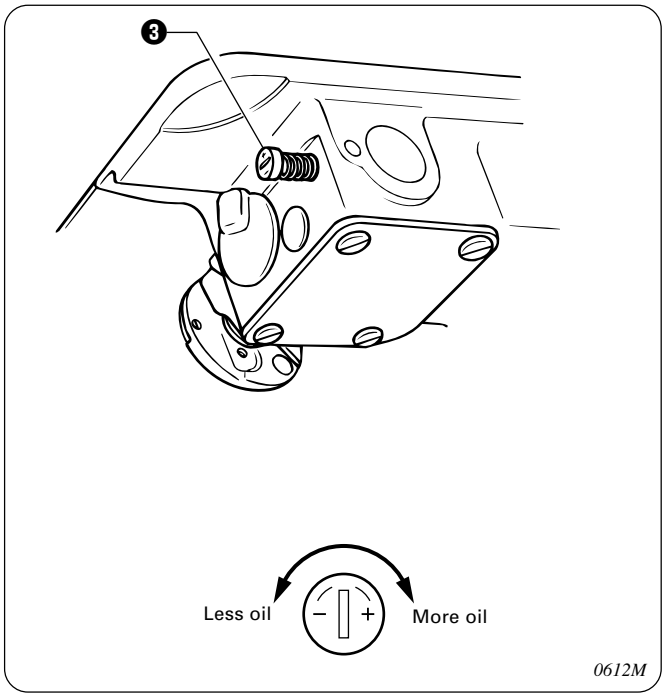
Use the following procedure to check the amount of oil being supplied to the rotary hook when replacing the rotary hook or when changing the sewing speed.



<Checking the lubrication amount>

1. Run the machine at the normal sewing speed for approximately 1 minute without sewing any material (following the same start/stop pattern as when actually sewing).
2. Place the lubrication amount check sheet ❶ to the left of the rotary hook ❷ and hold it there. Then run the sewing machine at the normal sewing speed for 10 seconds.
   (Any type of paper can be used as the lubrication amount check sheet ❶.)
3. Check the amount of oil which has spattered onto the sheet.

* Be sure to repeat this operation three to four times to check average lubrication amounts.

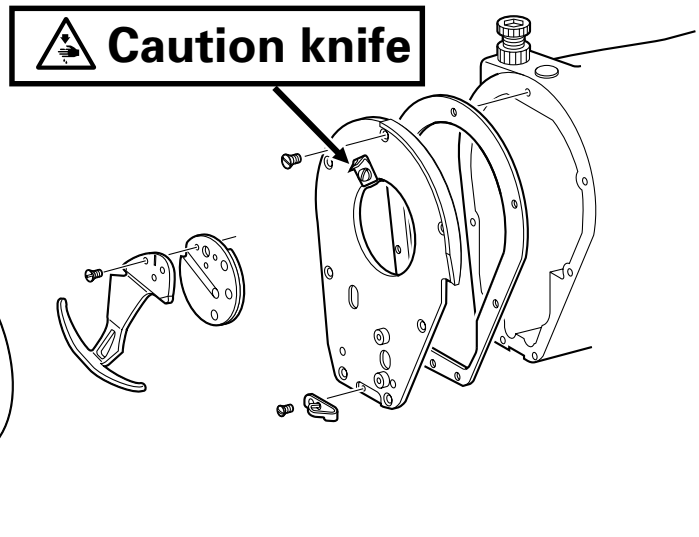


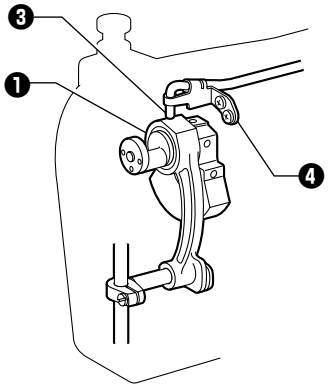
<Adjusting the lubrication amount>

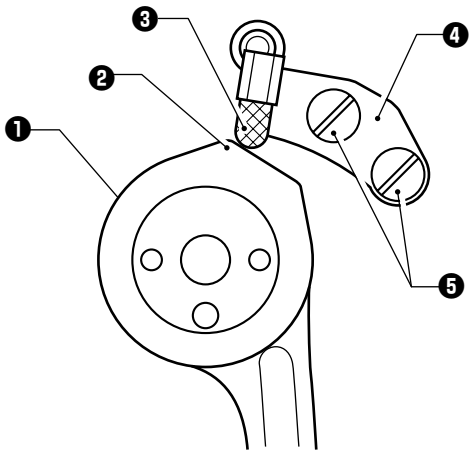
1. Tilt back the machine head.
2. Turn the lubrication adjustment screw ❸ to adjust the lubrication amount.
3. Return the machine head to the upright position.
4. Check the lubrication amount again according to the procedure given in "Checking the lubrication amount" above.
   * Turn the lubrication adjustment screw ❸ and check the lubrication amount repeatedly until the lubrication amount is correct.
5. Check the lubrication amount again after the sewing machine has been used for approximately two hours.

5-18. Adjusting the lubrication amount of the needle bar

1027S







1028S 1029S

Make this adjustment if there is a large amount of oil leaking from around the needle bar, or if needle zigzagging becomes more and more sluggish as sewing operation continues.

1. Remove the parts shown in the illustration while making this adjustment.
2. Turn the machine pulley and adjust the position of the needle bar lubrication support ❹ so that the projection on the needle bar connecting rod ❶ is slightly touching the wick ❸.
   Loosen the two screws ❺ to adjust.

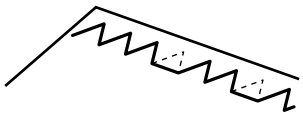
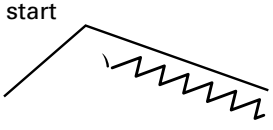
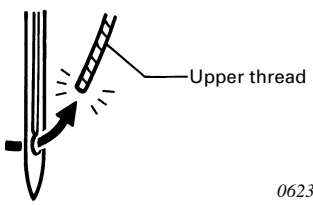
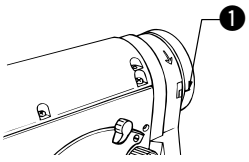
   Note:
   - If the projection on the needle bar connecting rod ❶ is touching the wick ❸ too firmly, the amount of oil leaking around the needle bar will increase.
   - In contrast, if they do not touch at all, needle zigzagging will become more and more sluggish as the sewing machine continues running, and seizure will result.

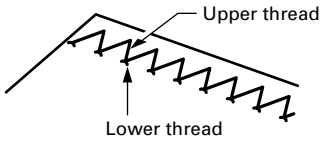
6. TROUBLESHOOTING

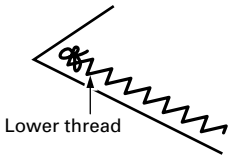
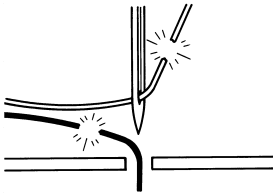
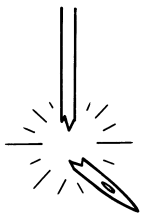
- Please check the following points before calling for repairs or service.
- If the following suggestions do not solve the problem, turn off the machine power supply and contact your nearest Brother service center.

⚠ CAUTION

Turn off the power switch and disconnect the power cord before carrying out troubleshooting, otherwise the machine will operate if the treadle is pressed by mistake, which could result in injury.
* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

Problem	Possible cause	Page
1. Upper thread is not tight. 0573M	• Is the upper thread tension too weak, or is the lower thread tension too strong? Adjust the upper thread tension or lower thread tension.	—
2. Lower thread is not tight. 0574M	• Is the lower thread tension too weak, or is the upper thread tension too strong? Adjust the lower thread tension or upper thread tension.	—
3. Skipped stitches occur while sewing  0621M	• Is the needle tip bent? Is the needle tip blunt? If the needle tip is bent or broken, replace the needle. • Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the machine properly threaded? If it is incorrect, thread the thread correctly. • Is the presser foot pressure too weak? Adjust the presser foot pressure. • Is the needle too thin? Replace the needle with a needle that is one rank thicker. • Is the presser foot too high? Adjust the height of the presser foot. • Is the needle and rotary hook timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook. • Is the thread tension spring too weak? Adjust the tension of the thread tension spring.	— — — — — 5-02 5-06 5-12 5-01
4. Skipped stitches at sewing start  0622M Thread unravelling at sewing start  0623M  0624M	• Are the thread take-up spring tensions too strong? Reduce the tension of the thread take-up springs. • Is the thread tension spring operating range too large? Lower the position of the thread tension spring. • Is the needle too wide? Try using a needle with a count that is one lower than the current needle. • Is the reference line ❶ on the machine pulley aligned with the mark on the belt cover at the sewing start... Align the reference line ❶ on the machine pulley with the mark on the belt cover at the sewing start. • Is the length of thread trailing out from the needle hole too short? Align the reference line ❶ on the machine pulley with the mark on the belt cover at the sewing start, and then pull out 50 mm of thread from the needle hole.	5-01 5-01 — — —

Problem	Possible cause	Page
5. Uneven seam 0625M	• Is the presser foot pressure too weak? Adjuste the presser foot pressure. • Is the feed dog too low? Adjust the feed dog height. • Is the bobbin scratched? If the bobbin is damaged, smooth it with an oiled grindstone or replace it.	— 5-02 —
6. Horizontal thread tightening not balanced  0626M	• Is the upper thread tension or lower thread tension too strong or to weak? Adjust the upper thread tension or lower thread tension. • Does the rotary disc rotate smoothly? Adjust the pre-tension. • Is the tension of the thread take-up spring correct? Adjust the tension of the thread take-up spring. • Is the stroke of the thread take-up spring correct? Adjust the position of the thread take-up spring. • Is the needle and rotary hook timing correct? Adjust the needle and rotary hook timing. • Is the needle and rotary hook timing correct? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook. • Is the thread too thick for the needle? Use the correct needle or the correct thread. • Is the rotary hook, bobbin case, thread take-up lever or some other part in the thread path damaged? Repair the damage, or replace the part with a new one.	— — 5-01 5-01 5-05 5-06 5-12 — —
7. Large degree of puckering (excess tension) 0627M	• Is the upper thread tension too strong? Make the upper thread tension as weak as possible. • Is the lower thread tension too strong? Make the lower thread tension as weak as possible. • Is the point of the needle broken? If the point of the needle is broken, replace the needle. • Is the needle too thick? Replace with as thin a needle as possible. • Are the thread take-up spring tensions too strong? Make the thread take-up spring tension as weak as possible. • Is the thread tension spring operating range too large? Lower the position of the thread tension spring to as low a position as possible. • Is the presser foot pressure too strong? Adjust the presser foot pressure. • Is the sewing machine running too fast? Check that an appropriate motor pulley (outer diameter) which matches the maximum sewing speed and the frequency is being used. If an incorrect motor pulley is being used, replace the motor pulley. • Is the angle of the feed dog incorrect? Tilt the front of the feed dog down slightly.	— — — — 5-01 5-01 — 1-02 5-03

Problem	Possible cause	Page
8. Lower thread is tangled at the sewing start.  0628M 0629M	• Is the bobbin spinning direction correct when the lower thread is being pulled? Set the bobbin so that it turns in the opposite direction to the rotary hook. • Is there too much thread wound onto the bobbin? The bobbin winding amount should not be more than 80%. • Is the bobbin turning smoothly? If the bobbin is not turning smoothly, replace the bobbin. • Is a bobbin other than the light-alloy bobbins specified by Brother being used? Use only bobbins which are specified by Brother.	— — — —
9. Upper and lower threads are breaking.  0471M	• Is the needle bent or is the needle tip broken? Replace the needle if it is bent or broken. • Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the needle properly threaded? If it is incorrect, thread the needle correctly. • Is the upper or lower thread tension too weak or too strong? Adjust the upper thread or lower thread tension. • Is the upper thread may be loose because the thread tension spring operating range is too small? Adjust the position of the thread tension spring. • Is the needle and rotary hock timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hock. • Is the thread too thick for the needle? Use the correct needle or the correct thread. • Is the rotary hook, bobbin case, thread take-up lever or some other part in the thread path damaged? Repair the damage, or replace the part with a new one.	— — — — 5-01 5-06 5-12 — —
10. Broken needles  0469M	• Is the material being pushed or pulled with excessive force during sewing? • Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the needle bent, is the needle tip broken, or is the needle hole blocked? Replace the needle. • Is the needle and rotary hook timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook. Caution • It is extremely dangerous to leave any pieces of broken needle sticking in the material. If the needle breaks, search for all pieces until the whole of the needle is found again. • Furthermore, we recommend that through steps be taken to account for such needles to comply with product liability regulations.	— — — 5-06 5-12

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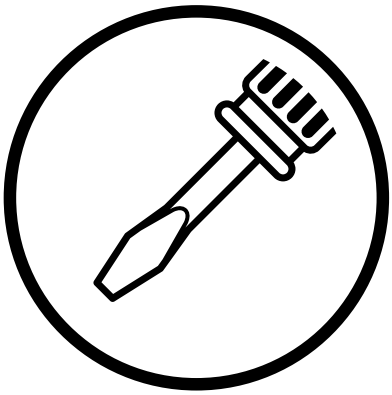

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